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THE SCIENTIFIC STUDY OF HUMAN SOCIETY

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THE SCIENTIFIC STUDY OF HUMAN SOCIETY

BY

FRANKLIN HENRY GIDDINGS, PH.D., LL.D.

Professor of Sociology and the History of Civilization in Columbia University; Fellow of the American Statistical Association; Member of the National Institute of Arts and Letters

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PREFACE

My purpose in this book has been to indicate wherein and to what extent Sociology is indubitably a *scientific* study of Human Society, and how it can be made more rigorously so. To this end I have undertaken to describe strict methods that sociology can avail itself of, and to point out precautions and limits which must be observed in the use of each.

While the book is not a treatise on sociology and makes no claim to be, it necessarily formulates the fundamental sociological problems, and sets forth the more important sociological generalizations that admit of verification.

Use of the book as a text should be preceded by a short introductory course, concrete and elementary; but I hope that it will meet the need for a rounding out and clinching work. Indeed, to be quite frank, I think that it *ought* to be used for that purpose until it is superseded by a better book in its field. At present it is the only work of its kind. I do not believe that a student has mastered the *essentials* of sociology, not to mention wealth of detail, until he has become acquainted with the subject matter to which these pages are devoted, whether he

obtains the knowledge from these pages themselves or from other sources.

Various chapters have appeared from time to time in the *Journal of Social Forces*, and portions of Chapter XII were printed some years ago in the *Publications of the American Statistical Association*. I am under many obligations to them, and above all to Dr. Howard W. Odum, Editor of the *Journal*, which I gratefully acknowledge.

To my departmental colleagues, Tenney, Lindsay, Chaddock, Ogburn, Shenton and Ross, I desire to express my grateful appreciation of valued suggestions and assistance.

F. H. G.

New York, Oct. 1, 1924.

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THE SCIENTIFIC STUDY OF HUMAN SOCIETY

CHAPTER I

SOCIETAL PATTERNS

William James's description of the world upon which a baby looks forth as a big and buzzing confusion has been quoted many times and will be quoted many times again. It is one of the best descriptions of anything ever written.

There are minds that remain infantile throughout life; they never discover order or meaning in their surroundings. There are minds that outgrow infancy more or less; to them parts of the world, here and there, become orderly in a simple, familiar way; and these familiar parts of their environment no longer bewilder them. Then there are minds that almost grow up. To them a great deal of the world becomes a scheme of things, which they think they understand; and many of them become so pleased with themselves and with what they have learned that they get into a way of believing that they know a great deal more than they really do. One part of the world in particular they find so comprehensible

that they want to take it to pieces and put it together again, with improvements. They entertain no doubt of their ability to make a good job of the undertaking. This part of the world, so provocative to tinkers (in particular to tinkers whose vocation is law making) is Human Society.

A relatively few minds find the world intelligible if and when they put forth effort to acquire knowledge of it; and among these a small number have enough curiosity and doggedness to make the effort painstakingly. They observe and compare, they count and measure, they experiment and "check up." These are the scientific minds. In the course of time they come to know more about the world than anybody else does, and they discover more ways of making it a comfortable place for men to live in than other folk have discovered. But oddly enough, the more they learn, the less impatient they seem to be to make everything over by direct action. In particular they become doubtful of the wisdom of drastic experimenting upon human society. They want first to see and be sure *what else* is likely to happen when an existing balance of interests or forces is upset.

The first bit of order which the infant mind perceives in the blooming and buzzing con-

fusion of its world, is a vague pattern. A contact, or pressure, or something warm, or loud, or bright, or pungent, is "this" way or it is "that" way; it happens "before" or it happens "after." Presently the mind perceives that some of these "somethings" recur in the same place or sequence. The warmth and the contact are always that way; the loud sound and the brightness are always this way; or perhaps it is the other way around, or the combinations are different. The warmth happens first and the pressure follows; the sound happens first and the brightness follows; or perhaps again, the order is not just this but there is *an* order. Always there is *an* arrangement of "somethings" in direction or in sequence, in space or in time, or in both, for an instant, or for a while; and any such arrangement of "somethings" is a pattern. Or, to put our cart before the horse, and so make a definition, a pattern is any arrangement of "somethings" in space or in time, or in both, for an instant or for a while.

With uncanny rapidity a young mind, if normally capable, discovers intricacies in its world pattern, one after another. It discovers gradations of pressure and of temperature, of light and shade, of pitch and of colour; it discovers near and far. Then it discovers similarities,

segregations and associations, divisibilities and factors, components and compositions, numbers and ratios. At length, after all this discernment, it discovers variables and variability, transformations, and progressions.

As soon as the nature of a pattern is perceived it is easy to see, further, that patterns are of three fundamental types. First, or sometimes to our apprehension, second (and not objectively one or the other) there is a *form* pattern, in which space positions are more conspicuous than time sequences, and quiescence is more conspicuous than motion, although time is always discoverable in space, and motion in quiescence, if we look for them. The form pattern is the graphic or the structural, it is the morphological pattern of things. The tracing from which a garment is cut, and the "cut" itself, the mould into which a casting is run, and the shape of the casting, a working drawing, a map, the topography of a region, the structure of a plant, the anatomy of an animal, all these are form patterns.

Second, or sometimes to our apprehension, first, there is an *action* pattern in which time sequence and change are more conspicuous than space position and quiescence, although these are present. The action pattern is the

dynamic, the physiological or functional, the behaviouristic pattern of things. The circling of negative electrons about their positive nucleus in the atom, of planets about their sun, the swirling motion of a tornadic storm or of a whirlpool, the turning of the leaves of plants toward light, are action patterns. The predictable performance of a kitten a few seconds old when placed on its back, is a complicated action pattern of the instinctive order. The kitten turns its head to one side, and then, with a screw-like motion, its shoulders; next it doubles in one paw and extends another; and finally, still twisting its spine, it turns its body until it rests on its belly. This sequence it repeats as often as it is placed on its back.[1]

Third to our apprehension (and this time there is no alternative order, we are not able to perceive it until we have discovered form and action patterns) there is a *factoral* pattern. Certain factors are combined in specific ways or ratios to constitute given products, and factors are of three kinds, component-constituent, dynamic, and conditional.

Every something is a lot of somethings. A population, a herd, or a swarm is a lot of individuals, human or animal. The human or

[1] Experiments of Professor Frederick Tilney.

animal organism is a combination of organs, these of tissues, these of cells, these of protoplasmic bodies, and these of molecules. Inorganic masses, too, are composed of molecules. Molecules are composed of atoms; and atoms of electrons. Composite somethings are also complex; that is to say, they are made up not only of components of like kind, but also of constituents of unlike kind. H_2O is the constituent-component factoral pattern of water. Carbon, hydrogen, nitrogen, oxygen, phosphorous, sulphur, sodium, potassium, magnesium, calcium, iron and chlorine, and occasionally other elements in combination are the constituent-component factors of protoplasm.

Factors that are difficult to imagine and so to know pictorially, but which we can know conceptually, and which are present in every pattern, are the dynamic ones. They are the factors of motion, change, doing. These are variously known as "energies" or "energy," "forces" or "force." All are modes of motion. Motions may be turbulent as in the wild dashing about of molecules which we know as heat, or coördinate, in which a body (theoretically a particle) moves consistently along a definite path, rectilinear or curving, so exactly that at any point its position with reference to an axis of abscissa and an axis of ordinates satisfies the

terms of an equation. The word "force" is correctly used only when employed to designate coördinate motion. To all other dynamic manifestations the more general word "energy" applies. Force, in other words, is only one form of energy.[2]

Factors of a third kind, entering into all patterns, are known as "conditions." They are of three categories, namely, place, time and circumstance.

The circumstance that we normally apprehend the fundamental aspects or types of pattern in a certain order (and factoral patterns always last) determines a certain normal order of procedure when we set about the systematic study of our world.

Our aim is to arrive at explanation and so at understanding, and, as a rule, we do not arrive at explanation by just dropping down on it. Usually we climb, and we require something to climb on, namely, accurate descriptions of form patterns, along with much history of them, accurate histories of action patterns, along with trustworthy description of them, and a good deal of factorizing, which consists in resolving a phenomenon into components or elements of place, time, circumstance, quality, magnitude,

[2] The reasons for this discrimination need not be stated here. They take us into the realm of the conservation of energy and the theory of quanta.

activity, behaviour or function, co-existence and sequence.

In the study of Human Society above all it is necessary to begin with a serviceable knowledge, descriptive and analytical, of form and action patterns, present and past. Until we have obtained it we can make no headway in attempts to arrive at an understanding of processes. An explanatory sociology is our final, not our initial, achievement.

It is, however, our chief concern in this book, and what I say here about patterns is an outline tracing only.

The societal form pattern is structural, by composition and by constitution. It is made up of human units, more or less alike, more or less different, combined in small groups, which, in turn, are combined in relatively large groups. To the possibilities of yet further combination, into great and ever greater groupings, there are no assignable limits.

A strictly new or original societal group is normally, and perhaps, if we look closely enough always a casual, that is to say, an accidental or otherwise fortuitous group. Its human units find themselves arriving in one place by luck of alluring occasion or opportunity, or because of

misfortune or disaster which has driven them from homes or haunts elsewhere.

A young man and a young woman attractive to each other meet casually at a neighbour's, a house-party, or a dance, fall in love and marry. A family and a household group result, and perhaps a kinship group which lives on through many generations.

Three or four young men meet by chance and are drawn to each other. They become companions. After a while it may happen that other men are taken into the comradeship, and they become a fraternity; or, discovering that they have a common interest, they found an association, or sodality, so named from the Latin *sodalis*, a mate.

A multitude of individuals attracted by a spectacle, a speaker, or perhaps nothing more substantial than a rumour, assemble as a curious crowd; or, infuriated by a crime or other intolerable wrong, or perhaps only by instigation or obsession, they converge in the sinister solidarity of a mob.

From far and near home seekers and adventurers invade a region only now made accessible or in which tempting resources have only now been discovered. Many remain, others come, and together they become a community.

More often than not casual groups have little cohesion and soon break up. Acquaintance groups, crowds, mobs and conventions fall within this category. Other groups, casual at first, develop cohesion and become self-continuing. In this category are families, households, kindreds, villages, larger communities, and nations; also fraternities, religious sects, partnerships, trading companies, labour unions, corporations, and political parties.

Among self-continuing groups the families, villages and larger communities include individuals of each sex. These groups are self-reproducing as well as otherwise self-continuing. They are genetic groups. The other self-continuing groups are only congregations: their members convene from time to time, and, as groups, they persist only by taking in new members from without.

Genetic groups are the adequate component groups of comprehensive human society. They only can perpetuate it. The groups that are congregate and nothing more are in strictness only constituent groups. Their functions are specialized, and they bring about a division of labour. Therefore they are interdependent and therefore, further, they constitute or organize society, while merely genetic groups, with all their multiplying and cohering only compose it.

The members of continuing societal groups, genetic or congregate, component or constituent, are of varying degrees of acquaintance and intimacy. Households, comradeships, and looser companionships, including play groups, are intimate groups; they are what Cooley has felicitously called "face to face" groups. Villagers are acquaintances, but not all of them are intimates. In larger communities are found many individuals who are strangers to one another, and in nations there are aliens.

In the scientific study of society the gradations of intimacy, down through mere acquaintance to non-acquaintance, have become the basis of a convenient division of labour. Social psychology occupies itself chiefly with the behaviouristic interactions of intimates, and the development thereby of the social attitudes and habits of *socii*, as the Latins called them. Societal psychology, or sociology, in distinction, while depending on social psychology at every step, occupies itself in the main with the genesis and the carrying on, and the characteristic achievements, of that comprehensive group which the Latins called *societas*.

The action patterns of society are modes of behaviour in which, usually, many individuals

in one place or situation and at one time, participate.

Whether an act (or chain of acts) constituting behaviour is performed by one individual only or by two or more or by many individuals at once is determined by the reach and scatter of stimulation, to which the behaviour is response. A hornet stings the baby. The reach of the stinging dart and the epidermal area directly affected are minute. The reaction is individual behaviour. Baby's shrieks, however, travel far, and scatter widely enough to reach the ears of mamma, grandma, nurse, housemaid and cook, and the behaviour then resulting is multi-individual or pluralistic. A hurdy-gurdy on the street, a parade, a circus, provoke multi-individual behaviour on a larger scale; a new oil field, or a new health or recreation region provoke it on a great scale, and a declaration of war on a national or imperial scale.

The reactions of many individuals to one stimulus which reaches all of them may be alike or unlike. The more nearly alike the individuals themselves are the greater is the chance that in any given case their responses will be similar. Also, as these individuals are more or less alike their responses are equally or unequally prompt, equally or unequally persistent.

Whether participated in by few or by many, multi-individual behaviour is usually complicated by the reactions of individuals to one another. The behaviour of each is a stimulus to others by way of suggestion or example, or other incitement, and each reacts by imitation, or otherwise, to stimuli received from others. So, complicated by interstimulation and response, multi-individual behaviour becomes co-individual.

Often enough repeated to become habitual, the modes of co-individual behaviour become folk-ways and institutions. Concretely these are the characteristic action patterns of human society.

Social psychology, taking the intimate group as its subject of major interest, as has been said, is especially interested in the genesis of co-individual behaviour, while societal psychology, or sociology, is especially concerned with its developments on the great scale, as in folk-ways and institutions, and their large-scale reactions upon human well-being.

In the historical evolution of human society form and action patterns are at every stage and at every period united. They are, in fact, identified. What is form in one aspect is action in another. We encounter first a succession

of form-action patterns which constitute savagery; then a succession of form-action patterns which constitute barbarism; and at length a succession of form-action patterns which constitute what we are pleased to call "civilization."

Human society, it is supposed, was preceded by that flocking and herding which we call "gregariousness." Herd fellows are creatures of one kind, but do not know that they are, because they can't talk, and such consciousness as they have attained has not become self-consciousness. Human beings can talk and are self-conscious and so can discover wherein they differ, to what extent they are alike. Knowledge of themselves as of one kind, or not, in respect of any feature, trait, interest or habit, as colour, temperament, curiosity, religion or thrift, is the "consciousness of kind." Human society is marked off from animal gregariousness by talk and the consciousness of kind.[3]

[3] Readers who have been brought up on a metaphysical psychology are warned that "consciousness" as I use the word in this book, and as I contend it should always be used in scientific discussion, is a name for a physiological phenomenon and not for an ontological mystery. A physiological and behaviourist psychology does not concede that consciousness *as a subjective state* affects anything or explains anything. But it conceives of consciousness as not more a subjective state of *mind* than it is a mechanistic state of *things*. Physiologically, *consciousness is a highly integrated awakeness and attentiveness of an organism* which has become tense, "all set," alert, and ready for business. Mechanistic consciousness is dynamic. It effects much and explains much.

Ages ago the human pack became a denizen or shelter group, occupying rock shelters or caverns which it defended. Within the shelter group, as components of it, were families. By multiplication of descendants families became kindreds. Mating was usually between members of different kindreds. It was "exogamous." Mating that was approved and sanctioned by the groups concerned constituted marriage. The family assumed various forms, pairing, polyandrian, polygamous, and tended to become monogamic. Children often, and perhaps for a long time usually, were described, named, and counted as of the kindred of the mother; so making the scheme of descent matrilineal, instead of patrilineal as it is in civilization. Kindreds that were intermingled and united by intermarriages were a kith. The normal human group, small at first (a petty horde, as it is now in surviving savagery) was a kin-and-kith group. The familiar phrase, "kin and kith," is significant of a long human history.

Within the kin-and-kith group there were men who habitually went together in adventure, in hunting or in fighting; they shared hardship, danger, and such food as they could get; they were messmates. Out of their comradeship developed brotherhoods, fraternities, sodalities.

Among brotherhoods were certain ones which selected new members from among men distinguished for knowledge, skill or wisdom. These became secret societies, cherishing "mysteries." Every art and craft, every cult of magic or "medicine," every tradition, was once a "mystery." Mysteries were the elements of culture, and as hordes multiplied and wandered their mystery or medicine men carried culture throughout wide regions, so creating the "culture areas" and the "culture patterns" which ethnology studies.

Among mysteries the supremely important ones were those of mana, spirits, and ghosts: the substance of religion. Mana as conceived was a contagious, mysterious power or influence to invigorate or weaken, heal or make ill, save or destroy, bless or curse. For a long time mana, good and bad, was identified with particular places and objects, and conspicuously with plants and animals that were thought to possess powers especially wonderful or important. Numerous human groups believed that by contact with a plant or animal whose mana was good they obtained thereby strength, security and good luck. A benign species or variety was regarded as sacred; it must always be protected, and might be eaten only in crises or on particular occasions to get "power" or

"salvation" from mysterious ill or pollution. The men and women themselves who obtained strength and immunity from the mana of a sacred plant or animal believed that they partook of its nature to such an extent that they became identified with it. In this sense they were born or re-born of it; in this sense they were descended from it, and they called themselves by its name. The species or object with which a human group became so identified was called a "totem" in one of the North American Indian tongues, and the word has now passed into ethnology as a generic term. Human groups identified with totems are known as "totem groups" or "totem kins." For ages in the past, it is probable, and throughout many parts of the world today, the "totem kin" is the distinctive social organization.

In ethnological writings the Scotch word "clan," not altogether appropriate, has come into use as a name for any unilateral kindred, matrilineal or patrilineal, totemic or not. The Greek patrilineal kindred was called the γένος and the Roman patrilineal kindred was called the *gens*. The latter word is commonly used now as a name for any patrilineal kindred. The corresponding adjective, "gentile," is used also as a noun.

The clan cherished traditions, enforced exogamy, and redressed injuries suffered by its members at the hands of outsiders. In North American Indian clans there were (and are) councils in which both men and women participated, and elderly wise men called sachems to whom deference was paid. These features are found in many parts of the world.

In Asia and in Europe, and perhaps elsewhere, nearly related gentiles who could trace and prove their lineage for four or five generations often lived together as a joint family or as a hamlet, and held property of certain kinds in joint possession. This organization persists in India, and surviving examples of it are found in Russia and in Southeastern Europe.

A kin-and-kith group large enough to people a village or a vicinage, and constituted of clans or not, was a tribe. Often it spoke a distinctive dialect and usually it had a simple organization for war, consisting of a council of braves and a chief or chieftains. Not infrequently a tribe was (and is) dual, consisting of two similar divisions or moieties each constituted of clans. Matrilineal tribes have usually been constituted of totemic kindreds and have lived by hunting and fishing supplemented by the rude agriculture that was possible before the plow was invented. The line between

savagery and barbarism is usually drawn at the attainment of a complex tribal organization and the simple beginnings of agriculture.

On the grass lands of Asia, Europe, and Africa cattle were domesticated, and tribes that lived by herding, often nomadic but not always, flourished as far east as Northwestern India and as far west as Ireland. Cattle stealing raids by tribe upon tribe brought about transforming changes in tribal organization.

Daring and successful chieftains received from their tribes, by way of recognition and reward, a major allotment of the stolen cattle, and rights of pasturage on border or frontier land which they undertook to defend. They had to have helpers, cowboys and fighters. These were not forthcoming from their tribe fellows, but could be picked up among outlaws, and ruined men whose tribes had been broken up, and who sought protection. This the chieftain who "took them on" gave them, and they, in return, gave allegiance and service. In this arrangement, made binding by an oath of allegiance, were the primal elements of *beneficium et commendatio* and of the *sacramentum fidelitatis*, in a word, of feudalism, and of the spoils system of later politics. Receiving shares of the yearly increase of the herd, many of these

fealty men grew rich and powerful, and, as "cow noblemen" (the Bo Aires of the Irish Brehon Laws) lorded it over impoverished tribesmen.

When the plow made possible a productive agriculture and a relatively settled life, joint families, or other four or five generation groups, grew into village communities. In these there was often an alien element set apart as a hamlet distinct from the "residential area" of the land-owning kinsmen. In the ancient laws of Wales we find descriptions of the arrangement. The kinsmen and their village were the *gwely*. The aliens were *alltuds* or *aillts*. The aliens, like the fealty men of the cattle herding tribe, had been luckless men, or their forbears had been; they had sought protection and had been taken on by a land-owning kindred to work the fields on a crop-sharing basis. The kinsmen proprietors among themselves were unequal, in distinction, in power, and in wealth, although jointly holding their land. The protected dependents received equal shares of land, cut up into narrow strips, and were held to equality in all things. In such communities of dependents possibly, indeed probably, we should look for the origins of the manorial populations of serfs or villein tenants of a later time.

From the earliest times there have been sacred places, rich in mana, or the homes of ghosts or tribal gods. Companies of pilgrims have resorted to them for healing or power. Also there have been strong places, that could be fortified and defended, and invaded populations have hastened to them. At sacred places and at strongholds there has been bartering; priests have taken up residence there; and garrisons have been established there; artisans have assembled there to practice their craft; skillful barterers have become merchants there; outlaws and adventurers have come, and if they could make themselves useful have been accepted. The places have become towns and the inhabitants townsmen. By the fiction of adoption, or naturalization, newcomers and aliens have been taken into ancient tribal organizations and have become citizens. The town has become a *polis* or city-state.

Related and neighbouring tribes, speaking dialects of a common language and defending themselves against common enemies, have federated or otherwise have been consolidated by war. Their military chieftains, appealed to in crises by priests, tribal judges, and people, have become priests and judges of final authority, and so, uniting three supreme functions in one sacred office, have become kings. Develop-

ing then political organization, consolidated tribes have become nations, each occupying a country, and the people of each compatriots.

The line between barbarism and civilization is usually drawn at the attainment of political organization by *polis* or nation.

Powerful and aggressive nations have conquered and annexed; they have created empires, adequate to defend civilization and to give it room.

CHAPTER II

SOCIETAL VARIABLES

Factorizing, supplementing description and history enlarges and deepens our knowledge, which, however, until one more element is injected remains only descriptive or historical knowledge, interesting and gratifying to intellectual curiosity, but often disappointing when we try to use it to arrive at effective knowledge.

Therefore, to arrive at explanation it is necessary, further and finally, to inquire to what extent factors, one by one or in combination, are subject to change; where, when, how and how fast they change; and what happens to a thing (or other phenomenon) in its integrity when this, that, or the other change or combination of changes occurs. If we are able to get this knowledge we have an effective tool to work with practically. We can then begin to foresee what will certainly or probably happen, and to make changes among factors which will lead on to other and perhaps great changes that we desire.

Changeable factors of natural phenomena are now known in all the sciences and in philosophy by the name "variables," a word long used in mathematics. It has the advantage of being explicit and precise. How naturally the use of it in the physical sciences has grown out of the use of it in mathematics is illustrated by our conceptions of velocity and acceleration. Velocity, speed, swiftness, is the motion of a body through a given distance in a given time, and both are variables. Each is subject to lengthening or shortening. The sprinter may on one occasion make a dash of a hundred yards and on another of three hundred yards. On one occasion it may take him two, three, or five more seconds to cover his distance than it did on a previous occasion. The acceleration of a falling body, second by second, is constant if only gravitation is acting; but the speed at which the body is going when it hits the ground varies with the number of seconds that it has been falling. A constant is an unchanging ratio of one variable quantity to another; for example, the unchanging ratio, of the circumference of a circle to its diameter. When we have discovered and made sure of a constant we have attained the supreme end of scientific study in one domain or part of a domain, and have equipped ourselves with perhaps the most

powerful tool that man can own and use. In electro-physics, chemistry, thermo-dynamics, and other inorganic sciences many constants have been found and verified. In the organic sciences the phenomena studied are so complicated that only approximations to constants have been obtained, and not many of them. The ratio of population to food, formulated by Dr. Raymond Pearl, is such an approximation. The Mendelian ratios of dominants and recessives to a total generation of hybrids, are rough approximations. It is probable that in psychology a number of useful approximations will be achieved. That we shall work out many very close approximations in the social sciences is doubtful. For a long time to come we shall hardly do more than discover such general relations as that of the approximately inverse ratio of a meeting of minds to an increasing heterogeneity of population, or as that of the increase of lawlessness with the multiplication of laws.

What then is possible? We can discriminate and identify variables and discover ways to measure amounts and rates of variability. We can ascertain the conditions under which variation occurs and (a closely related research, when not in fact the same one) we can ascertain how variables consort with one another; that

is to say, we can determine their concurrences, associations, and correlations. For the present our most serious work consists in obtaining correlations. These are by no means perfect substitutes for constants, but they are the next best thing.

What are the variables of human society that are important enough or significant enough to make it worth our while to observe and measure them, and to watch their consortings?

We must go rather far back. Behaviour of whatever kind or complexity, whether of one lone individual or of two or three associating individuals, or of a multitude of individuals carrying on as society, is a phase of organic activity, the activity of organized living matter; and organic activity is a variable, consorting with another variable which we call environment. What we want to know about these variables in any case (whether we are able to learn more or not) is, how they affect and determine one another, and what shifting combinations they make.

In order, however, to learn as much as this we find it necessary to resolve the comprehensive variables, environment and organism, into their own major components, and these, we discover, are a considerable lot of great variables of far-reaching potency, each of which

is further resolvable into lesser variables, also resolvable; and so on indefinitely. Perhaps it is because of this multiplicity of factors, and the inequality of their magnitudes, that many of our biological and psychological generalizations, and most of our historical and political generalizations, are interpretations of life in terms of one or two conspicuous variables only, and are therefore of little scientific, and of less practical value. Environment is construed as region, or climate, or flora, or fauna, or soil, whereas each of these factors and many another enters into the quality and destiny of every individual life. Organism is construed as heredity or as variability; and one or the other of these phenomena is "picked" by writers on human affairs to "play up" in their theorizings, whereas there is no organism that is not, throughout its existence, a phenomenon of inherited and transmissible mutations, and a center of minor variations which play a part in its individual life but are not transmissible.

Among environmental variables that affect all organisms are, bounty (including food, heat, and so on), and constraint (including dangers, adversities, hardships, and so on), which disciplines adaptability and brings about natural selection through the death rate of the non-fit and non-adaptable. Among environmental

variables, in addition to these, is stimulation, a necessary factor in all organic activity, including the activity of cells, tissues and organs, and, above all, of that activity of every organism as an integer, which we call its behaviour. Among yet other environmental variables in addition to bounty, constraint, and stimulation in its simpler modes, are variates and complexes of stimulation which enter into those modes and syntheses of pluralistic behaviour which constitute the gregariousness of animals and the societal activities of human beings. Chiefly important among these are dispersion or scatter of stimulation, interstimulation, acquaintance, and heritage or culture.

Among organic variables, discoverable in all organisms, are, viability (resistance to destructive influences, endurance, longevity), fertility, stability (anatomical and physical balance in the individual and breeding true to type by the race), variability, adaptability, and habit, a complex of adaptability and stability. Additional organic variables, discoverable in human beings, are, consciousness, including its phases, of conscious reaction to habit, emotion, imagination, and reflection. Yet other organic variables (products of the foregoing relatively simple ones) are reactions to interstimulation, similarities and dissimilarities of individuals to

one another, and an individual masterfulness here and there, all of which enter into gregariousness; and, finally, talk, a consciousness of kind, a concerted volition, and a collective masterfulness (of gang, bloc, class, or integral group), all of which enter into the phenomena of society.

Certain pairs of variables are specific determiners of behaviour and its modes, and are therefore of particular significance for our studies of mind and of society.

Stimulation (varying in kind, degree, and duration) and habit, are specific determiners of behaviour in general.

Dispersion (or scatter) of stimulation and degree of similarity (or of unlikeness) of the individuals or the groups reached by dispersed stimulation and reacting to it, are specific determiners of pluralistic behaviour.

Interstimulation among creatures of like kind, and reaction to it by them, are specific determiners of consorting, that is, of keeping together and going about, by kind.

Acquaintance, talk, and the consciousness of kind are specific determiners of human association.

In such and other combinations of these and other actually varying variables, in their fluctuations, correlations, syntheses and dis-

persions, are comprised all the phenomena of life which it is possible for man to know, including his own consciousness and purposes, his social relations, and his societal interests.

The gradation of organic forms and the varying range and complexity of organic activities serve as magnifying lenses through which we may observe how variations, consortings, disbandings, and re-consortings of environmental and organic variables produce their results.

Single cell organisms multiply by bodily division. They are incapable of more than an infinitesimal mental life, and, like enough, incapable even of that. Detached from one another, and each shifting for itself, they have too limited an experience and too little power of performance to learn much or to do much. The metazoa (many celled organisms) all of which are inheritors of a mutation which multiplied cells and differentiated them without altogether physically detaching them from one another, and which have survived in environments adequately bountiful and stimulating, are, by contrast, capable of much, and some of them (human beings) of indefinite, mental development. This capability, however, fell only to organisms which escaped that other mutation which multiplies and holds in physical attachment the undifferentiated cells or

groups of cells that compose the sponges, the corals, and other zoöphites, to which no range of experience and achievement is possible.

Here, obviously, is a generalization of some importance. A grouping and organization of differentiated cells into a metazoon, but with a physical detachment of the metazoon as an integer, is necessary to the development of mentality.

Yet mentality does not develop greatly or amount to much unless the organism can learn, and go on learning, one new thing after another. Now learning may be advantageous or dangerous. It involves a reconditioning of reflexes (a detachment of reaction from a familiar stimulus and a tieing up to a new one) and, presently, a reconditioning of the complexes and tendencies of reaction ("the prepotencies" of Allport's clarifying analysis) which we call instincts, and, after a while, a building up of new habits. In this process bewilderment and uncertainty are inevitable, and fatal mistakes are possible. The metazoa that live individually solitary, or almost solitary, lives, learn little. They develop little mentality. Apparently it is only the herding creatures (which mutually profit by individual discoveries of danger and reactions of fear, and sometimes join in collective defense or attack), and the

social creatures (human beings) that can safely react in new ways to any considerable extent.

What then is herding? It is a habit of consorting by animals of like kind that are physically detached, and could go apart if they would, but do not. It is a behaviour engendered by a play of common stimuli (a dispersed stimulation) upon creatures similar enough to react to it as a general thing in like ways, and by mutual stimulation (interstimulation) to which (because again of their similarity) they are sensitive. In other words, gregariousness is a continuing mental attachment, subsequent to and notwithstanding physical separateness.

Here, then, is another generalization of importance. Considerable mental development is possible only to creatures physically but not mentally separated.

Herd fellows are herdminded, following suggestion and example because they are a kind, but are not intelligent enough to know that they are a kind; a limitation which renders them incapable of discriminating among suggestions and examples by even so simple a means as preferring the suggestions and examples proceeding from one bunch of their herd fellows to those proceeding from another bunch. Therefore, while they are physically free, they remain psychologically unfree.

And because they are not mentally free, but are herdminded (each creature feeling and doing what each of his fellows feels and does) the mental development of gregarious animals remains limited and inferior. Mental development becomes potentially indefinite only when the thought no less than the bodily activity of the individual is made free, although instinctive and emotional attachment, and attachment by habit to others, continues; and this happens only among human beings living in society.

Human beings have acquired the power to think, to form conceptual ideas, to reflect, to put ideas together in trial and error combinations, which is to reason. With the power of thinking they have acquired the power to talk, and have developed conversation. They are able, therefore, to become acquainted. They can not only compare the behaviour of one with the behaviour of another, but also they can get at and compare one another's ideas, tastes, sentiments and purposes. They can sort each other into kinds. In a general way they are of one kind, and know it. In lesser ways, they are of different kinds, and each knows his own kind. Each has a consciousness of kind, more or less keen, more or less discriminating, more or less wide. Therefore, they

not only consort but also associate, each choosing with some range of freedom his associates, his *socii*. Accordingly, acquaintance, talk, and the consciousness of kind are, as was said, the specific determiners of association, an essential factor in which is a certain measure of mental freedom, of power to detach oneself in thought (and to a less degree in habits) from a *solidaire*, undifferentiated herdmindedness.

The development of mental detachment and, therefore, the realization of the higher possibilities of mentality by the human race, has been incredibly slow. Nevertheless, when human society, as a thing different from the mere animal herd, and immeasurably higher, came into existence, human individuals, physically free, were beginning also to be psychologically free. They had then begun to differ mentally one from another and from the mass, and thenceforth they differed more and more. They began to act, and have more and more acted, independently. They began to be free moral agents and responsible beings. Perhaps one day they will really become such.

Advance has been from savagery (in which mental solidarity was presumably not much less than in the troops of hominidae from which mankind descended) to and into civilization, which was made possible by discovery,

knowledge and invention (together constituting enlightenment) and by economic gain. In civilization, as we like to believe, individual freedom of thought has become, in a good measure, possible. The steps of the progress have been made out. Savagery is mitigated and tribal barbarism is attained through tribal integration and developments of mores. The higher barbarism of patronage and allegiance is attained through developments of personal masterfulness and domination. A first stage of civilization is attained through detachments and migrations of individuals and bands from the groups of their birth, and consequent interminglings of folks of diverse origins in growing populations that attract them. It is characterized by developments of sovereignty, and by political consolidations; by militarism, regimentation, coercion and standardization. A second stage of civilization is made possible by rebellions, revolts, criticisms, and developments of legality. It is characterized by developments of constitutionality, and by policies of liberalism. A third stage of civilization is being made possible by science. It will be characterized, if attained, by respect for the individualities of fellow beings; an attitude and a habit which will comprise regard and consideration for privacy, for self-determination,

for liberty of thought, speech and action, and for free moral agency and responsibility.

So we arrive at a third generalization of some importance. The indefinite development of mentality is possible only to human beings who not only are physically detached and free (as metazoa in general are) but also are intellectually free and morally responsible, and who, therefore, differ with one another more or less, according to the constitution and working of individual minds; although instinctively and emotionally and to a great extent in habit they remain attached to one another (as all gregarious creatures do) in fundamental relationships of group living.

If these three generalizations are true, they are damnatory against all programs of communism and communistic socialism.

Such are the greater societal variables, and their products. To learn more about them (both the variables and their products) to know them more precisely, and, above all, more fully and exactly to know how they evolve their products, is the aim of a scientific study of society.

CHAPTER III

THE SCIENTIFIC SCRUTINY OF SOCIETAL FACTS

For practical reasons even more than for merely intellectual ones, we need rigourously scientific studies of human society and of our individual relations to it. In particular we need such studies of the societal interests that are labeled "public policy," "education," "missions" and "social work." I am aware that this proposition is resented by men and women who suffer from an anti-"academic" complex and worry lest "the human touch," "the ways of the neighbourhood" and the naïve thinking of "plain people" shall have spontaneity squeezed out of them by theory. This is an unfortunate misapprehension of what science is and of what it does for us. It ought not to be necessary at this late day, but it is necessary, to tell the general public that science is nothing more nor less than getting at facts, and trying to understand them, and that what science does for us is nothing more nor less than helping us to face facts. Facing the facts that the

physical and biological sciences have made known to us has enabled us to live more comfortably and longer than men once did. Facing the facts that the social sciences are making known to us, and will make better known, should enable us to diminish human misery and to live more wisely than the human race has lived hitherto. In particular it should enable us to take the kinks out of our imperfect codes of conduct. It will be discovered one day that the chief value of social science, far from being academic, is moral.

Let me sharpen the point by illustrations. I have on my desk the latest report of an organization which purports to ameliorate prison life and to reform convicts. Little exact information is given. Instead, the pages are filled with autobiographical tales by "reformed" felons. These tell us that neglected childhood, evil communications, unemployment (for which the narrators were not to blame) or other hard luck, drove these unhappy persons into careers of crime which they would have followed to the end of their days if the beneficent organization had not discovered their inherent goodness and obtained for them, by parole or otherwise, "another chance." Conceivably one or two of the tales may be true, but no proof is offered that any of them is. If verification of

any sort has been attempted there is no mention of the fact in this self-glorifying report. Therefore, in all human probability, the organization has experimentally satisfied itself that there are enough rich morons in the world to sustain its merciful activities without asking embarrassing questions.

An active worker in an organization of wide reach, which devotes itself to the religious and moral guardianship of young men, read a seminar paper on the "program" which the association attempts to carry out. It appeared that four great lines of work had been projected and are being followed. Young men are being made physically "fit"; they are being intellectually "developed"; their religious life is being "deepened"; and they are being trained to be of "service." I asked the reader to describe the methods of checking up which the association employs to satisfy itself that these admirable objects are being attained. He was unable to enlighten us, and I therefore made my questions specific. Are the young men physically examined and rated from time to time by medical or other experts? No. Is their intellectual progress tested from time to time, as the progress of public school pupils is, or in any other way? No. Is the "depth" of religious life now and then sounded, or other-

wise measured? No. Are tangible evidences of "service" obtained and recorded? No.

Another seminar paper, read on another occasion, set forth the well-advertised social work of an "influential" metropolitan church. A chief item was the relief and "oversight" of more than one hundred indigent families. The writer of the paper (an unfeeling wretch) had asked the almoner what procedure was followed to ascertain that the families were deserving. Not satisfied with the answer received he had gone to the records of a charity organization society and had learned that more than ninety per cent of the families in question were "notorious" cases of professional mendicancy, each of them "working" from two or three to eight to ten sources of income.

My readers may object that these illustrations of irresponsible social work are not representative, presuming that they are discreditable survivals of traditions and practices now passing. Up to date social work, they may insist, is both more intelligently and more responsibly conducted.

I want to believe that it is, but then, *is it*, always or generally? Does anybody *know* that it usually is, or is everybody just *saying* that it is? If anybody does know he is more wicked than the servant who hid his lord's treasure in

a napkin, if he keeps the information much longer to himself. Frankly, I doubt if the information is obtainable. I have made more attempts to get it than I can count, and without success. One thing is certain. Our social workers and our uplift organizations do not know what results they are getting, and by what methods they are getting them, in the same rigourous sense in which a well-managed business corporation knows what it is getting out of its personnel, its machines, and its methods.

This brings us back to my main contention, that the major value of a scientific study of society is moral. It is only by the methods of making sure (which constitute scientific study) that we ever can know what our public policies, our educational procedures, our religious endeavours and our social work are accomplishing. Therefore nothing but the scientific study of society can save us from the sin, the scandal and the humiliation of obtaining money under false pretenses, for the attainment of righteous ends which, like enough, we are not in fact attaining.

The scientific study of any subject is a substitution of businesslike ways of "making sure" about it for the lazy habit of "taking it for

granted" and the worse habit of making irresponsible assertions about it. To make sure, it is necessary to have done with a careless "looking into it" and to undertake precise observations, many times repeated. It is necessary to make measurements and accountings, to substitute realistic thinking (an honest dealing with facts as they are) for wishful or fanciful or other self deceiving thinking and to carry on a systematic "checking up." At every step we must make sure that the methods which we use and rely on have been accredited by exhaustive criticism and trial, and are applicable to the investigation in hand.

Inasmuch then, as science, as was said, "is nothing more nor less than getting at facts, and trying to understand them" the discovery of facts *which prove to be facts* is initial scientific activity. In the nature of things it continues more or less fortuitously, however systematic we try to make it. The *scrutiny* of alleged facts to determine whether or not they *are* facts, is the fundamental *systematic* work of science.

We make acquaintance with a fact as an individual instance of something or other which arrests attention. A hundred other things, quite as obvious, quite as important, and possibly more significant, we may not see at all. If we reflect for a moment on this circumstance

we discover that the assortment of facts which we carry in our heads and build into the structure of knowledge must be smaller than the assortment which makes up the world of actuality, and differently arranged. So, right at the beginning of inquiry, we are warned to watch our steps. Relativity, it seems, is a factor in reality.

The particular instance of something or other which has arrested our attention looks like a unit or item, detached or detachable, and so we think of it for the moment. Then we make further discoveries. Our instance is a unit as far as its relations with other instances like itself or different happen to go, but if we leave them out of our field of vision and forget them, and look intently at our particular instance we see it resolve into a multitude of lesser items, arranged perhaps in clusters or patterns, and, like enough, moving about. Each of these items in turn, we presently ascertain, is composite, and so on, without end.

Human society abounds in examples and the social worker encounters them. He may be interested chiefly in a mill town, or chiefly in a neighbourhood, or chiefly in certain families. At one time he will be most concerned about what the mill town or the neighbourhood or a family *does*. At another time he will be most

concerned about what it *is*. As long as he is attending to what the mill town does he thinks of it as a whole. It is a community. He compares it with other communities as wholes. He observes similarities and differences of activity and achievement. These observations may lead him to ask why such similarities and differences exist, how they are to be accounted for. Trying to answer this question, he finds himself inquiring what his mill town is, and from that moment he is resolving it into components. He is discovering that it is made up of corporations, trade unions, churches, schools, shops and markets, professional men and business men, skilled mechanics and unskilled labourers, native born folk and foreign born folk of various nationalities; in fine, of inhabitants arranged in bewildering clusters and patterns. If he is interested chiefly in a neighbourhood or in a family he has a like experience. He thinks of it as a unit while he is learning what it does. He necessarily thinks of it as a composite when he tries to learn what it is.

A particular instance, then, is a unit or not as we happen, or have occasion, to see it, and we have occasion to see it in the one or the other way according to the nature of the investigation that we attempt to make. If it is

our purpose to learn how our particular instance is related to other instances like itself, or behaves toward them or with them, or enters into combination with them to make up a bigger whole; or how it is related to things (that is to say instances) unlike itself, and behaves toward them or with them, or enters into combination with them—our instance is a unit, and we deal with it as such. But if our purpose is to learn what it *is*, if we are attempting to account for it, and to understand it, our unit of investigation must obviously be an item of lower order. Practically it must be an item of the next lower order. In accounting for things we must go back step by step.

Here it is important to understand that in so viewing the particular instance, and in so choosing a unit of investigation, we are not acting arbitrarily. In books on scientific method, and most often, perhaps, in books on statistical method, we encounter the statement that we do take our unit arbitrarily, or pragmatically. This is a shorthand expression, a talk saving device, and harmless enough if we do not take it too literally. Speaking strictly, our choice is determined by a logical necessity. We take the particular instance as a unit if we are investigating what it does. We do not take

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it as a unit, but resolve it into units of the next lower order if we are investigating what it is.

What is the practical value of all this for the social worker, or for the investigator? It is the same for both, and it lies in an admonition. Don't mix up things that should be discriminated, and don't take your knowledge for something that it is not. Do not deceive yourself with the notion that you can understand what your nation, or your town, or your neighbourhood, or your family, *does*, or why it does it, until you have had the patience to learn what it *is*, or with the notion that you can learn what it is in any other way than by painstakingly resolving it into component units and scrutinizing them. Short cuts to a knowledge of society and to proficiency in helping it through tribulations will yield you nothing, and get you nowhere.

When we have determined whether the particular instance of something or other which has arrested our attention, and in which we have become interested, shall be regarded for our further purposes as doing something, or as being or becoming something, and thereby have chosen our unit subject, it is good scientific practice to ascertain next, as accurately as may be necessary for our further purposes, its position in time and in space. To place a

thing roughly in its time and space relations to other things is usually not difficult. To place it accurately is another matter. This operation takes patience, energy, time and money. Unfortunately, in the study of societal variables these costs are often almost prohibitive. It is therefore highly important that the investigator should bring good practical judgment to the task of deciding how precise he ought to be; in other words, how much precision is worth while. He is likely to find that this depends upon the shifting, that is to say, the variability, of the position which he is observing. If the variability is negligible—as it is, for example, in the case of a town as old as London or even as San Francisco; or as it is in the case of one of those French peasant families that have lived continuously on the same piece of land for more than five hundred years—the problem is relatively simple. But it is not at all simple in the case of one of those colonies of Italians or of Jews that are moving continuously from one end of one side of Manhattan Island to the other, or of a migrating church, or school, or shopping district. It is least of all simple in the case of a migrating wage-earning family, or dependent family, or criminal family. Yet it is precisely in these cases that an accurate determination of position in space and in

time is imperative for purposes of identification.

Similar requirements of scientific scrutiny apply to our determination of other categorical matters, including the conditions attaching to persistence in one or another place or in one or another succession of events; the identifying marks and attributes of the thing, individual, or group in which we are interested; its form or changing forms; its magnitudes, or varying magnitudes, and its reactions, that is to say, its behaviour. Here should be noted certain important differences between the task of the physicist or of the biologist, on the one hand, and that of the sociologist, on the other. Form and magnitude are, in general, of more immediate and continuing concern to the physicist and the biologist than they are to the sociologist, although they never can be neglected by the latter. Again, the forms which the physical and biological sciences have to do with are relatively definite and constant patterns, while those that sociology has to do with are somewhat less definite and more variable patterns. Magnitudes also offer striking contrasts. The magnitudes with which physics and chemistry have to do are inconceivably minute, and can be measured only with instruments of the utmost precision. Those with which astronomy

has to do are inconceivably vast, but their calculation is made possible by means of the fine measurements of physics. The magnitudes with which sociology has to do lie within the ranges of every day observation, and they are measured by commonplace counting, and by subsequent statistical operations. Accurate counting, however, is not always as easy as it looks, and costly investigations are too often invalidated by untrustworthy enumerations. And statistical methods are fine-edged tools. The sociologist and the social worker should acquire expertness in counting, under varying circumstances, including the coming and going of not too large crowds, and they must get a sound, if not necessarily extensive, knowledge of statistics.

When it comes to the scrutiny of qualities and reactions, as much painstaking and precision are necessary in sociology as in the physical sciences or in biology. Carelessness and error are fatal. It is above all important to discriminate between those relatively unvarying ways in which things, individuals and groups impinge upon our consciousness,—and which we call their traits, properties, characters or characteristics, or, collectively, their qualities—and those relatively variable ways of impinging which we call their changes,

activities, reactions, or behaviour. Among qualities it is necessary to discriminate between those which are usually, but not always, associated with their subjects, and those which, always inseparable from them, we call their attributes. In human beings inherited qualities only are attributes.

The behaviour in which the social psychologist is interested is the reaction of an individual or of an intimate group to a fellow individual or to another intimate group. It may take the form of indifference or of interest; of fear or of trust; of liking or of disliking; of anger or of sympathy; of envy, jealousy, malice or hate, or of rejoicing in another's good fortune; of respect, reverence or affection. It may be aloofness or coöperation. The social worker is every moment dealing with social or unsocial behaviour. He should thoroughly know his social psychology.

The behaviour in which the sociologist is interested, as was shown in our first chapter, is the approximately simultaneous reaction of a considerable number of individuals that happen to be in the same situation or circumstance. Their reactions may be alike or different; equally or unequally alert and persistent. This behaviour we called multi-individual or pluralistic. It develops into group ways, class ways,

and folk ways, and into organization. The social worker is at all times in contact with it and dealing with it. He should thoroughly know his sociology.

Pluralistic behaviour can be seen or heard, or both seen and heard, and no further acquaintance with it is necessary to satisfy us of its occurrence, but to check up our knowledge of a particular instance of occurrence, so that it shall be reasonably complete and accurate, it is necessary to do more or less counting. Only by counting can we know how much more effective in provoking pluralistic reaction a given stimulus is at one time than at another, or in one place than in another. Counting for this purpose has become an important factor in determining the relative attractiveness of residential areas, of occupations, recreations, styles, and a hundred other interests of every day life. Business and professional men make or lose money by their attention or indifference to it. To determine the relative efficacy of alternative stimuli in calling forth pluralistic response, for example in shop work, or in school work, the counting must be accurate. So, also, it must be to determine alertness and persistence of response to varying stimuli. By no other means can we certainly know, for example, whether the percentage of workers at

their places within three minutes after the whistle blows in the morning is equal to the percentage outside the door within three minutes after it blows at noon, or the effect upon these ratios of such devices as fines and bonuses. Persisting reaction and its extent can be ascertained in no other way than by counting, which is always resorted to for measuring the effectiveness of religious and of political activity, but too often stops short of satisfying completeness. I have before me an account of the revival meetings which Dwight L. Moody conducted in one of the larger American cities. It says: "A careful computation puts the total attendance at 900,000 and the converts at 4,000." We are not told how many of the 4,000 converts (they were less than three tenths of one per cent of the attendance) *continued* to live a "sober, righteous, and godly life."

The consciousness of kind is obvious enough as a state of mind which continually obtrudes itself into our relations with other persons, but our notion of it may be vague. A simple counting of a few items will clarify and define. Write down the names of twenty-five acquaintances of your own sex and colour race whom you like and associate with, and twenty-five names of persons who annoy you so that you dislike them and, whenever possible, avoid

them. Go over each list and note in which one you find more persons who are like yourself in colouring (blondness or brunetness); in which one you find more who are like yourself in being conventional or unconventional in dress and in manners; in which one you find more whose notions about right and wrong are like your own; in which one you find more whose tastes and interests are yours. Now get a considerable number of careful persons to make similar lists and comparisons. The more lists you can get the better, but fifty is a good number. Assemble the results, and you will make interesting discoveries. Similarity or contrast of colouring within the same colour race is a negligible factor in your likings and dislikings. You may have been told or taught otherwise. Similar or dissimilar notions of right and wrong have a good deal of influence, but the big factors are similarities or dissimilarities of manners, tastes and interests.[1]

We observe concerted volition of a spontaneous, or at least unorganized, kind whenever we see a mob bent on mischief, or watch the proceedings of a public meeting which adopts resolutions, or participates in a referendum election. These casual observations, however, tell us only that people actually do

[1] For detail of this experiment *vide* Chapter VII.

these things. By counting certain combinations of items we make further discoveries. For example, not everybody participates who might; the number of qualified voters answering to a roll call varies from question to question, from resolution to resolution, and you do not have to make an impossible number of countings to learn that the constant factor affecting the number of votes is the degree of mental equipment[2] required, not to *understand* the question, but to be *interested* in it. It will not be long before the data made available in states which have referendum voting on questions will afford a convincing confirmation of other hotly discussed results of mentality tests.

Pluralistic behaviour, complicated by the consciousness of kind, and becoming concerted volition, is over and over repeated. Through repetition it acquires form or mode. It is subject to fault-finding and disapproval. Forms or modes that are usually approved survive. They become conventions or customs, that is to say, group ways, class ways and folk ways. That each of these is followed more or less, and disregarded more or less, is familiar knowl-

[2] I use here the term "mental equipment" instead of "intelligence" because as yet we are unable to test intelligence unmixed with habit, knowledge, and familiarity, irrespective of native intelligence. Mental equipment includes the factor intelligence, the factors familiarity and practice, and the factor knowledge.

edge; but in order to know which ones are most followed and which ones most disregarded, in particular to know to what extent each one is followed and each one disregarded, it is necessary to do a good deal of counting. This proposition will not be disputed, and I need not say more about it now.

The particular instance of something or other in which one is interested may be amenable to experimental control, which is the best of all the ways of scientific scrutiny, or it may not be. It has generally been held that the phenomena of human society are too complicated for a strictly scientific experimental investigation. It is true, of course, that we are all the time making social and societal experiments. In no other field do we make so many, but these are not usually of the scientific sort. In scientific experimentation we control everything that happens. We determine when it shall occur and where. We arrange circumstances and surroundings; atmospheres and temperatures; possible ways of getting in and possible ways of getting out. We take out something that has been in, or put in something that has been out, and see what happens. At every step we describe what we do and the things that we deal with, with accurate specifications. We count, measure and weigh, and

make records. To manage all this in societal experimentation cannot be easy. Is it at all possible?

Among unnecessary ways of being mistaken none is more unnecessary or more discredited by experience than to assume that something or other can not be done.

As far as I know there is no record of a strictly scientific societal experiment completely carried through on a large scale, but there have been many tentative and partial experiments (experiments in experimenting, if one may call them that) and they are multiplying. The more promising ones have been and are being made in workshops and in schools and by a few intelligently managed corporations, industrial or philanthropic. The more disappointing, although often sincerely attempted ones, have been made by neighbourhood houses and by churches. The cause of failure, in many instances, has been a commendable aversion to anything that has looked like prying into private affairs and keeping tab on them. This aversion I share and unqualifiedly approve; but in the environment of every settlement and of every church there are opportunities for social and societal experimentation that would not require intrusiveness or meddling.

That these have not been more successfully exploited must be explained, I am afraid, by aversion to the tedium of counting and recording, to note books and statistics.

Among small but insignificant societal experiments which, without question, could be conducted in a strictly scientific manner and carried through to indisputable results, are a few rigourous and crucial ones to determine what are the best ways and means of awakening group, class, or neighbourhood interest, and of holding it. Settlements and churches are continually trying out these ways and means, practical ones and fantastic ones, sane ones and crazy ones, but their results are astonishingly meagre. Their reports, with commendable exceptions, are a flotsam of unverified assertions, uncritical impressions, and optimistic forecasts, made, not to establish a fact, but to wheedle money for more loose work of the same kind. It is possible to do this work in a scientific and convincing way, and it ought to be so done. A good many schools and a good many employers of wage-earners are making carefully conducted experiments in the formation of group and class habits. The results are of great and increasing value. Year by year they are being checked up and ex-

tended. Big corporations managed by men of vision are making experiments in organization. These, too, are of increasing value.

The final verification of an alleged fact (its conclusive establishment as a fact) is attained only through much repeating of observations and measurements. Not until we can safely challenge anybody to go over our work and discover errors in it can we be quite sure that we *know* anything. As I have heretofore insisted[3] a fact in the scientific sense of the word "is the close agreement of many observations or measurements of the same phenomenon." Error creeps into observation in unaccountable ways, and different observers make different mistakes. Precise measurement by one person at one time and in one place is next to impossible. The nearest approximation to accuracy is made by taking the average of many measurements made by many measurers and calculating its probable error. Physicists and chemists, astronomers and geologists, biologists and psychologists, are tirelessly repeating their observations and their measurements of presumptive fact. Social psychologists and sociologists must get this habit.

[3] *Inductive Sociology*, p. 13, and *Studies in the Theory of Human Society*, p. 131.

CHAPTER IV

THE CLASSIFICATION OF SOCIETAL FACTS

There is a way of sorting facts to suit ourselves which is sometimes, but not always, legitimate. We often call it "classification," but it has little resemblance to classification in the scientific meaning of the word. It proceeds on an assumption that:

> The particular point of view, or the particular characteristic that is pitched upon as definitive in the classification of the facts of life, depends upon the interest from which a discrimination of the facts is sought.[1]

Intent upon interest, it picks facts and pigeon-holes them regardless of any quality or behaviour which *they* have or exhibit *as a trait in common*, and solely with reference to the way, often adventitious, in which they affect somebody or some thing *not one of themselves:* something or somebody extrinsic to themselves. This kind of classification may be called pragmatic.

Scientific classification, by contrast, is descriptive. It picks and sorts facts with refer-

[1] Veblen, *The Theory of the Leisure Class*, p. 9.

ence to traits *inherent in themselves*, or characteristic of themselves, which they possess in common, one with another, among themselves: common intrinsic traits. Each class or category is created by dividing an aggregate of items into two parts (dichotomy); one (the designated class or category) comprising all items that exhibit a certain designated trait, the other, a remainder, (which may constitute another class or other classes) comprising all items that do not exhibit *that* particular trait.

The purpose of pragmatic classification is utilitarian: it may or may not have intellectual value. Too often it is employed not to get at truth, but to prove a case. The purpose of descriptive classification is to extend and clarify knowledge.

I cannot better expand definition of the nature and purpose of scientific classification than by quoting a few lines written many years ago.

> If we were unaware of differences, we should not know. If our eyes were not sensitive to differences of brightness and of colour, if our ears were deaf to gradations of sound, and if the nerves of the skin detected no inequalities of pressure, the external world would remain, for our minds, a blank. Discrimination, then, is the beginning of knowledge. Nevertheless, it is only a beginning.
>
> If we knew nothing but the differences of things, we should soon reach the limit of the detail that our minds could hold. Endless progress in knowledge is possible only because we

observe resemblances as well as differences. As rapidly as we discover that things are alike, we put them together in our thought as a group, or class, or kind. This enables us to think about them collectively by a single effort of attention, instead of separately by innumerable efforts. We owe all science to this possibility of economizing our mental energies, by grouping things in our thoughts into classes or kinds.

Comparatively few persons make their mental groupings in a strictly methodical way. To observe systematically and classify with precision—that is, to group like things together with accuracy—is to be scientific.

Classification, then, is the foundation of all scientific knowledge; and classification consists simply in putting together in our thought those things that are truly and essentially alike.[2]

What, then, do we mean by "resemblance," by true and essential similarity?

When we attempt to answer this question we discover that we can define resemblance only in terms of difference! Obviously, if a fact differs from an alleged other fact in no particular whatsoever, or however slight, the two are identical; there is only one fact. If however, they differ ever so little there are two identities, and if the difference is minute we say that they are similar. If the difference is considerable we say that the two facts are "somewhat" alike. If the difference is great we say that the two facts are different, that they are not alike. What, then, we ask again, is a resemblance? and now we answer: *It is a difference*

[2] Giddings, *Elements of Sociology*, pp. 1 and 2.

less than a limiting difference, which it may or may not be worth while to determine with precision.

How could it be determined with precision if we should think that worth while? To this question the answer is: By taking advantage of one outstanding and amazing fact, namely, that everything in the universe, whether it be a thing, a thought, or a person, can be resolved into components, and these into lesser components, *ad infinitum*. A lump of matter is composed of molecules; a molecule is composed of atoms; an atom is composed of electrons. What an electron is composed of no man yet knows, but that it is composite probably no scientific man seriously doubts. Accordingly, resemblance, like everything else, must be conceived as composite. Its components may conveniently be called "points of resemblance," and resemblance is small or great according as it comprises few or many points of resemblance.

In the nomenclature of logic any trait or characteristic of quality, magnitude, or behaviour which is inseparable from a thing or a thought is called an *attribute*, and any attribute may be a point of resemblance. Therefore, two or more things or individuals are more or less alike according as they have many or few attributes in common.

And this is not quite the end of the matter. An attribute is composite, it can be resolved, or analyzed, and a great many attributes are hybrids. A crude logic used to say that a thing is or is not this or that; it is *a* or it is not *a*. A more refined logic has discovered that it may be both *a* and not *a*. Is a boy truthful or not truthful? With the exception of George Washington every boy that ever has lived has been both. He has told the truth and he has lied. Is a man white or coloured? A mulatto, a quadroon, or an octoroon is both. The United States census classifies him as coloured if he is known to have any negro blood in him. In Cuba he is classified as white if he is known to have any white blood in him.

Here we arrive at a question of scientific procedure which is often of practical importance. How should a thing or an individual that is both *a* and not *a* be classified? Logic is more and more following the common sense rule that we follow in every-day life. It says that a thing is *a* if it is *more a* than not *a*, at any rate if it is much more. A boy is truthful if he lies not "never" but, in the language of *Pinafore*, "hardly ever." A state is republican if it usually returns a republican majority.

In every-day speech we discriminate things or individuals that are usually *a*, or mostly *a*,

from things or individuals that are completely or always, *a*, by saying that those which are mostly or usually so-and-so are typically or modally so-and-so, "type" having a connotation of quality, and "mode" a connotation of number.

From the foregoing considerations it follows that classes or categories fall into different arrangements with reference to one another. We usually think of them, I suppose, as excluding one another, like circles that are externally tangential, no part of circle A cutting into circle B. We get this arrangement when all the facts to be classified are completely and always *a*, and never to any extent not *a*; but since a fact may be both *a* and not *a* we often get an arrangement of categories which are partly exclusive, but not wholly so, like circles A and B that intersect. And because any category may be divided into sub-categories, and any one of these into sub-sub-categories, and so on, we may get an arrangement like that of intra-secting circles which touch at one point like hoops of different sizes held in one hand.

Of sub-classification there is more now to be said.

Within any class A, comprising all individuals that possess the attribute *a* and excluding all that do not possess it, there may be in-

dividuals that possess also an attribute *b*, but not attribute *c* or *d*; other individuals that possess also an attribute *c*, but not attribute *b* or *d*; and yet other individuals who possess attribute *d* but not attribute *b* or *c*. These differing sub-divisions of A constitute respectively the sub-classes *Ab*, *Ac*, *Ad*. Each is formed by dichotomy.

In like manner, within any designated sub-class *Ab*, there may be individuals that possess in addition to the attribute *ab*, the attribute *m*; others that possess, beside the attribute *ab*, the attribute *n*; and yet others that possess, beside *ab*, the attribute *o*, and so on, thereby constituting the sub-sub-classes, *abm*, *abn*, *abo*, each formed by subjecting *ab* to dichotomy.

Significant implications of the foregoing propositions must be borne in mind. Neglect to discriminate them means fallacy. One of these implications is, that the more individuals a class comprises, the more sub-classes or sub-categories it comprises: the bigger a convention is, the more kinds of cranks we find in it. A second implication is, that each successive sub-classification adds a new attribute to the number of attributes which each member of the new sub-class possesses. In number of attributes *a sub-class is also a superclass*. A third implication is that the larger the number

of attributes possessed by a class or sub-class, and therefore the further sub-classification proceeds, the smaller is the number of individuals in the newly formed sub-class. If we sub-divide the category "citizens" until we arrive at a sub-category in which everybody has an understanding mind, honest habits, an unselfish purpose, and education enough to know the difference between a tax and a dividend, we shall arrive at a number that will not fatigue a finite intelligence to grasp.

It is obvious that classification carried out into sub-classification cannot be comprehensively plotted by a succession of points along a single line. Categories of equal rank, A, B, C, D, or *a*, *b*, *c*, *d*, (for example, riveters, bricklayers, carpenters, plasterers) are legitimately and most conveniently indicated by a succession of names or symbols, preferably following one another along a level line like the column headings of a table. Categories of sub-classification, sub-sub-classification, sub-sub-sub-classification, and so on, (for example, riveters who have become foremen, riveters who have been foremen and have become superintendents, and so on) must then be indicated by sub-headings along horizontal lines of successively lower and lower level, following one another in a vertical succession down the col-

umns. Sorting individuals or things into groups of equal rank, or level, is coördinate classification. Sorting the individuals in any one of these groups into a succession of sub-categories, by successive dichotomies, is subordinate classification. The horizontal line of column headings and the vertical line of column descent enclose a surface, any point in which represents a possible classificatory relationship to any other point. Comprehensive classification, therefore, can be plotted as a tabular diagram, or pattern, but not otherwise.

Since the column of sub-classes made by successive dichotomies is constituted by taking into account at every step an additional attribute and excluding all individuals that do not possess it, it may be of any one of four descriptions. The addition may be quantitative only, for example, a number as in the succession one, two, three. This succession, arranged from smallest to largest or from largest to smallest, constitutes an array. All statistical classifications are arrays, for example, age classes, one to four years, inclusive, five to nine years, inclusive, ten to fourteen years, inclusive.[3]

[3] The reader unfamiliar with these matters may fall into the error of finding this account of age classification a contradiction of the statement that the further sub-classification is extended the smaller is the number of individuals in each successive class, because he will probably call to mind

A column of successive sub-classes of a second description is a gradation. It plots intensities, as of darkness or light, of bitterness or sweetness, or of pain or pleasure.

A column of successive sub-classes of a third description shows a trend, or a line of direction. Along a straight road a hundred individuals may walk to a point *a*, where fifty of them branch off. The remaining fifty may continue on the straight road to a point *b*, where twenty may branch off. The remaining thirty may continue to a point *c*, and so on. All who continue on the straight road follow a trend.

Finally, a column of successive sub-classes may show genesis. Some of the earlier vertebrates became fishes. The others did not. Some of the fishes became amphibia. The others did not. Some of the amphibians became reptiles. The others did not. Some of the reptiles became mammals, while others became birds, and others continued to be reptiles. Some of the mammals became primates. The others did not. At length some

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the fact that in a sorting of a population into age classes there will be, like enough, more individuals in one of the intermediate classes than in one or another of the preceding or younger classes. There is, however, no contradiction. The distribution which he has in mind is a distribution not of all those born, but of those living. A distribution of all born, gives, of course, a succession of numerically smaller and smaller classes.

of the primates took to the ground and became men. The others stayed in the trees and are apes to this day.

The subject matter of classification may consist of concepts only. The dichotomies are made in thought only. The objective universe consists of groups which are actual. They are segregations of things and activities. The dichotomies have been made by actual processes which have been observed by men and can be observed now.

Societal facts are actualities. Classification of them is a sorting of them into actual, or as we usually say, factual, groups, the dichotomies of which have been actually made by processes which men have observed and may now observe. Here, much condensed, is the resulting scheme of societal genesis.[4]

[4] In adapting the arrangement to page dimensions it has been necessary to identify items by numbers and letters. In a broad tabular arrangement items in which a given number, the same number with a, and the same number with ac all occur would stand on the same horizontal line; and items in which a number with b and the same number with bd would in like manner stand on the same horizontal line.

CATEGORICAL SCHEME OF SOCIETAL GENESIS

I	II	III
I Factual Categories subject to Factual Dichotomous Division by or in an Observed Process (Each Identified by a number.)		
	II Alternative Possibilities (Each Identified by a number and one letter.)	
		III Resultant Categories (Each Identified by a number and two letters.)
1. Psychological		
	1a. Cause	
		1ac. Stimulus or situation
	1b. Effect	
		1bd. Reaction
2. Reaction to one given stimulus or situation		
	2a. By one individual only	
		2ac. Singularistic behaviour: Individual psychology

2b. By more than one individual

2bd. Pluralistic behaviour: Societal psychology, sociology

3. Pluralistic behaviour

3a. Responses of individuals, prevailingly dissimilar

3b. Responses of individuals, prevailingly similar

3bd. Like behaviour

4. Like behaviour

4a. Not concentrative upon a point or place

4b. Concentrative upon a point or place

4bd. Concourse

5. Concourse

5a. Uncomplicated by segregative interstimulation and response

5b. Complicated by segregative interstimulation and response

5bd. Intra-responding group

6. Intra-responding group

6a. Not composed of individuals of one race or species only

6b. Composed of individuals of one race or species only

6bd. Psychologically homogeneous kindred

7. Psychologically homogeneous kindred
   - 7a. Not of both sexes and not of more than one generation
   - 7b. Of both sexes and of more than one generation
     - 7bd. Self-perpetuating psychologically homogeneous kindred

8. Self-perpetuating psychologically homogeneous kindred
   - 8a. Not consorting
   - 8b. Consorting
     - 8bd. Self-perpetuating psychologically homogeneous kinship group

9. Self-perpetuating psychologically homogeneous kinship group
   - 9a. Without consciousness of kind: gregarious
     - 9ac. Swarm, flock, herd, of animals
   - 9b. With consciousness of kind: social
     - 9bd. Society, self-perpetuating societal group, of human beings: folk

10. Self-perpetuating societal group: folk
    - 10a. Not increasing
    - 10b. Increasing, and in certain instances sending forth emigrants and colonists
      - 10bd. Social population

11. Social population
    - 11a. Not becoming complicated by receiving immigrants
      - 11ac. Homogeneous
    - 11b. Complicated by receiving immigrants
      - 11bd. Heterogeneous: Composite

12. Composite social population
    - 12a. Not prevailingly of like impulses, beliefs, ideas, and purposes
    - 12b. Prevailingly of like impulses, beliefs, ideas, and purposes
      - 12bd. Like-minded population

13. Like-minded population
    - 13a. Associative only
    - 13b. Associative and concertive
      - 13bd. Concerted action: combined action, cooperation

14. Concerted action
    - 14a. Emotional and spasmodic
    - 14b. Deliberative and orderly
        - 14bd. Folk-ways, productive of a cultural heritage

15. Folk-ways
    - 15a. Non-appreciative of factors and products
    - 15b. Appreciative of factors and products, esteeming and valuing them; creating societal values
        - 15bd. Culturistic society

16. Culturistic society
    - 16a. Not producing initiators, leaders
    - 16b. Producing initiators, leaders
        - 16bd. Protocracy

17. Protocracy
    - 17a. Not developing into or creating a definite ruling group or ruler
    - 17b. Developing into or creating a definite ruling group or ruler
        - 17bd. Coördinated society

18. Coördinated society
    - 18a. Not integrating
    - 18b. Integrating
        - 18bd. Organized society

19. Organized society
    - 19a. Not controlling

19b. Controlling

19bd. Societal self-control

20. Societal self-control

20a. Restrictive

20b. Liberative

20bd. Adjustment

21. Adjustment

21a. Not productive of desired change

21b. Productive of desired change

21bd. Achievement

22. Achievement

22a. Not making life more desirable

22b. Making life more desirable

22bd. Amelioration

23. Amelioration

23a. Not favouring urvival of departures from type or mean

23b. Favouring survival of departures from type or mean

23bd. Variation

24. Variation

24a. Not adapting individuals to social life

24b. Adapting individuals to social life

24bd. Socialization

25. Socialization

25a. Not increasing self-determination and responsibility of individuals

25b. Increasing self-determination and responsibility of individuals

25bd. Individuation

In the world of actualities things do not stay put; they move about. In new positions their activities may change, and the incidence of activity inevitably does change. Plants, animals, and human beings do not behave forever in the same way. They change their habits. Consequently, in classification facts shift about from category to category.

It follows that in sociology a study of societal variability, carried out into a classificatory scheme, and thereby checked up, is of correlative importance with the study of societal genesis, in like manner carried out.

In the scheme of variability it is necessary to include categories and details which may be omitted from the scheme of genesis, and from the foregoing condensed scheme have been. Among these are the sub-categories of causation. The scheme must begin with an analysis of the creative dynamics of a people. The scheme must include, also, integrations of coordinate categories. The scheme as a whole, therefore, is more than a column of successive sub-classes. It is a diagram or pattern. Greatly condensed, it follows.

CATEGORICAL SCHEME OF SOCIETAL VARIABILITY

- Creative Dynamics of a People
  - Regional Give and Take
    - Situation
      - Inaccessible
      - Accessible
    - Temperature
      - Hot to torrid
      - Cold to arctic
    - Humidity
      - Wet
      - Arid
    - Rock, soil, water
      - Barren, non-utilizable
      - Productive, utilizable
  - Inhabitants
    - Indigenous plants
      - Multiplying
      - Not multiplying
    - Indigenous animals
      - Multiplying
      - Not multiplying
    - Aboriginal or other subjugated human inhabitants
      - Multiplying
      - Not multiplying
  - Circumstantial Pressure
    - Calamity
      - Improbable, infrequent
      - Imminent, frequent
    - Pestilence
      - Occasional, infrequent
      - Recurrent, frequent
    - Hardships and dangers
      - Of isolation
      - Of crowding
    - Attitude of neighbouring peoples
      - Hostile
      - Friendly
  - Population (dominant inhabitants)
    - Fecundity
      - Births not exceeding deaths
      - Births exceeding deaths
    - Mobility
      - Quiet, non-migratory
      - Restless, migratory
    - Arrangement
      - Dispersive
      - Aggregative
    - Composition
      - Homogeneous
      - Heterogeneous
- Culturistic Society
  - Like-mindedness
    - Impulses, beliefs, ideas, and purposes prevailingly unlike
    - Impulses, beliefs, ideas, and purposes prevailingly alike
  - Consciousness of kind
    - Emotional predominantly
    - Reflective predominantly
  - Collective action
    - Spasmodic, tumultuous
    - Deliberative, orderly

- Folk-ways
  - Not enriching cultural heritage
  - Enriching cultural heritage
- Organized society
  - Organizing agent
    - Indefinite, protocratic
    - Definite, a ruling personage or group
  - Relationships
    - Not integrated
    - Integrated
  - Control
    - Restrictive
    - Liberative
  - Adjustment
    - Not progressive
    - Progressive
  - Achievement
    - Amelioration
      - Not cumulative
      - Cumulative
    - Variation
      - Variates not multiplying
      - Variates multiplying
    - Socialization
      - Not progressive
      - Progressive
    - Individuation
      - Not progressive
      - Progressive

It may be objected to these schemes that they are not the only possible ones, inasmuch as there may be as many dichotomies of a class as there are attributes discoverable in it from which to make a selection. To this objection I reply: Try it out and see if you can make other schemes of societal facts which shall conform to five scientific requirements, namely, (1) they shall be at no point pragmatic, but at every point consistent and descriptive; (2) the line of genesis shall be a self-consistent trend of dichotomies; (3) the diagram or pattern shall be self-consistent and comprehensive; (4) the dichotomies shall be not only logical but also observable actual processes of an actual world;

(5) the resultant classes shall be more than concepts: they shall be realities of flesh and blood, behaviour and state. I wish you well in your attempt, and will only add that I do not now recall other schemes of classification in the realm of sociology that have conformed to the first of these requirements, to say nothing of the other four. All that I remember, including many with which I have myself experimented, have been more or less pragmatic.

CHAPTER V

THE PLURALISTIC FIELD AND THE SAMPLE

For statistical purposes any plural number of things, qualities, circumstances or happenings, or other items, is a pluralistic field. If the number of items is not too great we can count them and one by one scrutinize them. "Too great" is a relative term, however, meaning too great for our resources of money, number of competent enumerators at command, time, and so on. For the United States Census a hundred million and more individuals are not too many to count. To study them all one by one would be another matter and practically impossible.

Every observable phase of human society is statistically a pluralistic field in the same sense or way that population is. It is resolvable into items, which theoretically may be counted, and one by one scrutinized, but which practically may be far more numerous (even immensely more numerous) than we can either scrutinize or count with such limited resources of energy, time and means as we command. Even na-

tional censuses have rarely undertaken to make a complete and trustworthy count of items in any societal field other than that of population. To mention only matters of major importance, there has never yet been in the United States a complete count throughout the nation of either births or deaths. For a century there was no attempt to count all marriages. No count of religious believers has been satisfactory. Citizens of voting age are enumerated, but those legally qualified to vote are not. In all of these fields, however, incomplete and otherwise imperfect counts have repeatedly been made, and they have cost a great deal of money.

Are these incomplete counts of scientific or of practical value? Is there any way of ascertaining how much or how little they are good for?

The statistician calls incomplete counts "samplings," and we assume that they may be, and often are, of considerable importance. If they are not, quantitative studies of biological, psychological and societal phenomena, including matters economic, legal, and political, made by individuals or private organizations are worthless, for, one and all, they are samplings, and our costly reports on stature and weight, intelligence rankings, unemployment,

wages, family budgets, and many other interesting matters, are but litter on our shelves. Theoretically, moreover, this condemnation would necessarily be made sweeping, because, theoretically every known aggregate of things or persons is only a sample of an infinite series; and, to go to the other pole of possibility, an item, or count, which we assume to be a sample, may turn out to be the total aggregate now known or knowable.

In the attempt to determine when and how far a sample is a trustworthy and reasonably adequate picture of an entire pluralistic field, which may safely be used when we wish to proceed with inductive research, we have developed a theory and a technique of sampling.

What then is a sample? The statistician defines it as any item or plural number of items which, we can be reasonably sure, is fairly representative of the entire aggregate.

What, however, do we mean by representative? The root meaning of "represent" (*re*, again, and *praesentare*, to place before, to present) has become in modern usage "to present in place of something else, to exhibit the counterpart or image of." Thus a painting may represent a landscape or a face. Accordingly, the primary meaning of "representative" is, "fitted to represent," and this phrase, some-

what expanded, becomes, "fitted to represent" truthfully, without misleading, and therefore justly. Finally, by further development of the implicit idea, we get the meaning, one who, or that which, "stands for" another or for others "as an agent, deputy or substitute," without misleading or injustice. These definitions make sufficiently clear the nature of a true or good sample viewed as a representative item or count. For scientific purposes a sample is any fact (for statistical purposes any item or count) which *adequately and without misleading* stands for, or may be taken as a substitute for, an entire pluralistic field.

How and when is such a thing possible?

Obviously any fact of sort or of size, of quality or of quantity, is truly representative and therefore may without error be taken as a sample of a pluralistic field, if the difference between any item whatsoever of the aggregate and any other item of it is negligible for the purpose in hand. There is no need to pick and choose, and it makes no difference whether we pick and choose or not. We may shut our eyes and take an item, or two or three or more items, at random; or, if we prefer, we may look over the field and deliberately select an item or items according to our whim. Either way there is no possibility of error; the item or

the count of items taken is a good sample of the entire lot. Such a field, in which all differences are negligible, we call "homogeneous."

Among all observed pluralistic fields, however, (not to mention all possible ones) the strictly homogeneous aggregates are relatively few. Far more numerous are the approximately homogeneous fields in which the differences between item and item are not quite negligible for the purpose in hand. Whatever item or count is taken from one of these fields as a sample, will be, in appreciable measure, inadequate or misleading. As far as we can we must minimize error. Obviously, we shall only magnify it if we pick and choose, selecting our item or count according to our preference, prejudice, or other bias. Therefore, in taking our sample of such a field we must take it at random, thereby eliminating bias.

This consideration discloses a significant fallacy in our theory of "representation" as a political device. Speaking in severely scientific terms, the representatives that we send to legislative bodies are not strictly good samples of their constituencies. We elect them, that is to say, we permit and expect every voter to exercise choice. He may and does give full expression to his preference, prejudice or whim. To get a true sample of our political popula-

tion we should resort to the casting of lots, as the Athenians at one time did. Whether that would be good politics or not, is another question.

Yet more numerous than approximately homogeneous aggregates are those which are unmistakably heterogeneous. Think of the variety of blossoms in the most unpretentious flower-garden; of the kinds of grasses, clovers, and weeds in an old pasture. Go through a forest, and count the species of deciduous trees, or of pines. These all are highly heterogeneous fields, but their heterogeneity is as nothing by comparison with the variegation of the pluralistic fields that make up human society. Think of the range of age classes in any population. Think of the ethnic composition of the American people, the native and the foreign-born, the colour races, the nationalities. How many sects or religious denominations should we find if we could discover them all? How many occupations, each calling for a distinctive proficiency, could we count?

When we reflect upon variegations like these it does not take us long to perceive that no one item or count of items taken at random without other procedure can be an acceptable sample of a heterogeneous field. Chance would give us perhaps a daffodil or a hollyhock as our

sample of a garden containing also tulips, roses, pansies, and a dozen other common flowers in their respective seasons. It would give us Catholics or Baptists, as like as not, as our sample of a religious population containing also Presbyterians, Methodists, Second Adventists, Mormons, and fifty-seven or more other varieties of religious experience. What further procedure then is necessary?

Plainly our sample must be a compound affair, and our first step toward obtaining its factors and putting them together is to resolve our pluralistic field into component kinds of items.

Every qualitative kind or quantitative class that is significant for our purpose must be included, and each kind or class must be approximately homogeneous. All items within the kind or class must be alike, and likeness, as was explained in a discussion of classification must be conceived as a difference less than a limiting difference which is significant for our purpose. In like manner, a quantitative class must be understood to be a plural number of quantitative items within limits of inequality which are significant for our purpose.[1]

[1] Methods of measuring heterogeneity (or approximation to homogeneity) and of ascertaining the limits within which differences are significant, are set forth in manuals of statistical theory.

When the entire heterogeneous field has been resolved into component fields, each approximately homogeneous according to foregoing definitions, a sample of each must be taken at random. Each regarded by itself will be approximately adequate and not seriously misleading. Collectively, however, the combination of these samples will be inadequate, and possibly so far misleading as to be worthless, unless one further precaution is taken.

The samples may be equally large or small, or fortuitously unequal, but qualitative kinds and quantitative classes usually are found to be respectively composed of unequal numbers of units. Each is a relatively large group of things, of activities, or of persons, or what not; or it is a small group, as may happen. Unless these inequalities are allowed for and represented the compound sample is misleading. Therefore, any sampling of a heterogeneous pluralistic field must bring together samples taken at random from each homogeneous field that is a significant component of the entire heterogeneous aggregate, and the size of each sample must be proportionate to the relative quantitative value of the homogeneous field from which it is taken.

Examples of practically bad and scientifically worthless samplings of hetergoeneous plu-

ralistic fields made in societal surveys and elsewhere could be multiplied indefinitely. Let us be content for the present with two, which are of generally recognized interest and importance.

One is our sampling of public opinion. A practice has grown up of interviewing individuals in various walks of life to ascertain their reactions to innumerable matters of belief, morals, domestic legislation, and world politics. Another practice is that of taking straw votes. Most of the samples obtained by either of these methods are invalid; they have little value even as indications of an actual state of public prejudice or conviction. Now and then they are taken at random, and they would meet scientific requirements if each were taken from a homogeneous field; but attention to this point is rarely discovered. Interviews and straw votes from employers, wage earners, shop keepers, and professional men, or from Fundamentalists and Modernists, from liberals and authoritarians, from internationalists and nationalists, are jumbled and scrambled. No attempt is made to get reactions from each distinctive component group of the entire heterogeneous field of makers of opinion, and to see that each is represented in proportion to its relative quantitative importance.

The second example is taken from the practice of representative government, already referred to. Not only, as was said, are our representatives in legislative bodies selections rather than samples, but also, even as preferences they represent constituencies as territorial groups only, or, more precisely, they directly represent them only on a territorial basis. Incidentally or accidentally they may represent them also as interest, or as cultural, or as proficiency groups; that is to say, as capitalistic or proletarian classes, employer or wage earner ranks, agricultural or industrial blocs, Catholic sodalities or Protestant sects, educated or uneducated consortings, and so on. The soviet scheme of government, by contrast, is theoretically based upon the idea that these interest, cultural, and proficiency groupings, rather than territorial groupings, should be represented in the political scheme. Which plan is politically better we are not now attempting to decide. We are here concerned only with the scientific question whether, in a strictly scientific sense of the term, either plan is representative government, and no further analysis should be necessary to make it quite clear to the statistical mind that it is not. Neither the one plan nor the other gives us representation within a meaning of the word

which must be adhered to for scientific purposes. To make a legislative body really representative of a politically organized people it would be necessary to constitute it of deputies from both territorial constituencies and bloc constituencies, which are important enough to be politically significant; and to apportion the representation of the latter as we now apportion representatives of territorial groups, according to the relative quantitative importance of each group.

CHAPTER VI

THE STUDY OF CASES

The attribute or trait, in virtue of which an individual or other unit is assigned to this or that class when we sort things, is an abstraction. We arrive at it by analytical thinking. In the real world it does not exist apart from the person or thing that is sorted, and in whom or in which it is associated with other attributes. No scientific study can prosper when this elemental truth is more than temporarily forgotten, or is too often or too long ignored. Always we must come back from our abstractions and our generalizations to a new scrutiny of concrete aggregates; to actual human individuals, actual animals and plants, actual inorganic things.

Also, we must keep in mind the fact that every individual or other so-called unit that we can study is in reality an aggregate. It is made up of components, each of which is an aggregate made up of components, and so on back through molecule and atom to electron, which looks to us now like *ultima thule*, but presumably is not.

Therefore, it seems, everything that we can study is a pluralistic field, and, in strict theory (as has already been remarked) every pluralistic field in the world of actuality which we can actually know is a sample, or a part of a sample, taken from an infinite field.

To say all this in so many words is perhaps to be too scrupulously academic. To students of the older sciences I suspect that it is, but I have reason to think that to students of the sciences of society it ought to be said now and then. The societal field is so extensive and so complicated that it is not easy to keep it all in view. By keeping it all in view I of course do not mean attempting to become proficient in the study of every part of it. That would be out of the question. I mean only attempting to see how every part of the societal field is related to every other part, and every aspect to every other aspect, and therefore to realize the necessity of checking up expert work in one domain by expert work in another. At the moment I am trying to help the scientific student of society to see that there are two elementary and fundamental aspects of his subject matter which he must continuously keep in mind, and never permit to become dissociated in his thinking.

One of these aspects is *the distribution* of every attribute or trait that he discovers. How widely, for example, is the attribute "blondness" distributed in a population; how widely is the status "foreign born" distributed; how widely is the condition dependency distributed; and so on? This is a statistical aspect.

The other aspect to be kept in mind is, what and how many distinguishable attributes are found *in combination*, first in any reasonably good sample of a pluralistic field; second, in any given component group or individual or other unit entering into the composition of the sample. For example, what other conditions besides dependency, and what attributes of status, habit or trait may be discovered in the make-up of a dependent family or a dependent individual?

It is plain that we have here two definitely contrasted procedures. In the one we follow the distribution of a particular trait, quality, habit or other phenomenon as far as we can. In the other we ascertain as completely as we can the number and variety of traits, qualities, habits, or what not, combined in a particular instance. The first of these procedures has long been known as the statistical method, which of course it is. The second procedure has almost as long been known as the case

method, or the study of cases. It is sometimes called the monographic or intensive method, a name associated with the life work of LePlay. It is also sometimes called the diagnostic method.

The term last named reminds us that at this point we should observe the distinction between case *study* and case *work*. In case work the social worker of whatever description is attempting to bring about a reconditioning and improvement in his "case." The nurse coöperating with the physician is attempting to restore her patient to health. The psychiatrist is attempting to bring about an orderly and normal mental functioning. The worker among destitute or degenerate families is attempting to bring about normal relations, activities and status. The neighbourhood worker is trying to clean up, stimulate and re-order the neighbourhood; the community worker is undertaking to deepen the sense of community responsibility, to make community organization more complete and effective, and to raise the standards of community welfare. Real achievement in any of these fields, it should be unnecessary to argue, is impossible unless effort is directed by knowledge. The "case" must be diagnosed and understood before it can be effectively handled and bettered. This preliminary enterprise is case study.

The range of case study in the societal domain is as wide as human interests, its continuity is as prolonged as human history. The case under investigation may be one human individual only or only an episode in his life; or it might conceivably be a nation or an empire, or an epoch of history. The cases with which social workers are apt to be concerned are individuals, families, neighbourhoods and communities. The cases in which ethnologists, historians, and statesmen are apt to be interested are non-civilized tribes, culture areas, historical epochs and politically organized populations. Demographers are concerned with the evolution and degeneration of populations in respect of their biological and psychological quality, and of their vitality.

The study of cases in a field as complicated as the societal has naturally enough been more or less unsystematic. Sometimes it has been more pretentious than painstaking, but on the whole it has made headway. It has developed, or rather it is developing, a technique, by no means perfect but distinctly promising. The first rule and principle of it is summarized in the one word "thoroughness." The first task, when taking up the study of a case, is to find out all that can be found out about it, and to scrutinize every seeming fact to make sure of

actuality. A careful person of good intelligence, who is plodding and conscientious, can become a successful student of cases; a brilliant student who is careless and unmethodical never can. The second rule and principle of case study is that as rapidly and as widely as possible comparisons must be made of case with case. There is always a presumption that a case is, to a certain extent, unique; that nothing exactly like it is to be found elsewhere or has ever appeared before, and it is of the first importance that its exact variation from everything else should be determined; but there is also a presumption that in many respects it is like other cases. If it is, a certain norm, or "usual" complex of factors can be ascertained. To describe it accurately is essential. Quantitative data may be discovered. It may be found that in certain numerical features a case is average, below average, or above average. The measure should be determined.

The greater part of social work must necessarily proceed with reference to norms of one or another kind. The case that is to be bettered in any way is presumably one that in various particulars is below normal, average or standard. If it were not known or suspected to be so it would probably not receive attention as one calling for the effort of the social

worker, and there would be no particular point in trying to help it. Therefore, plainly enough, it is the duty of the diagnostician to determine with as much exactness as possible what the norm, average or standard for this class of cases is.

Roughly, it usually is determined by case observers and monographists by mere observational comparison. The norms arrived at are approximations only. But such studies are year by year becoming more precise, which means that statistical methods are being more and more employed and perfected. They are even being introduced with success into ethnological studies and into studies of legislation. In demographic studies they are, of course, highly developed, and invariably are employed, as they are also at the other end of the case range, namely, in strictly scientific physiological and psychiatric studies of individuals. It is in the middle range, namely in studies of families, neighbourhoods and communities that exact methods are least developed and in which, it is to be hoped, they will presently receive more attention.

The circumstance that students of social work cases are largely occupied with subnormal and abnormal phenomena creates an intellectual danger which calls for mention.

Unless these investigators are constantly on guard their thinking gets "off side." They see humanity and the societal order in deceptive colours, inaccurate proportions and distorted perspectives. Now and then they acquire unfortunate "hunches." To correct these errors and to avoid bias social workers and students of social work cases need to keep in touch with researches that are being carried on in the study of normal social and societal evolution, and to familiarize themselves with attested results. There has been much discussion of the value (or lack of value) of historical and systematic sociology for investigators in the fields of deficiency, delinquency, and dependency, and of neighbourhood conditions. Teachers and social workers have been interviewed and their opinions have been collated. The net result has been an expression of doubt, running into dogmatic denial, of the "practical" value of sociology. If I may be permitted to express an individual reaction to this attitude, it is that the unbelievers have missed the point. I do not recall instances in which the writers of replies to questionnaires have pointed out what I believe to be the most substantial and important service of sociology to social workers. It cannot give them rules of technique; those must be developed out of trial and

error experimenting. But sociology can give them, and should give them, poise and balance, a comprehensive view, a sense of relative values, an apprehension of proportions and of probabilities. Attentive study of the trend and sweep of societal evolution from primal folk-ways through barbarism and historic civilizations, to the comprehensiveness and complexity of our existing societal order cannot fail to nurture the saving grace and the sanity of common sense.

One further aspect of case phenomena is significant, and an increasing recognition of it will greatly facilitate fruitful case study. Any case whatsoever is either fortuitious or historical. The fortuitious case is accidental or occasional. It "just happens," once, or now and then. Often it is generative. That is to say, at the moment when it comes under observation the complicated phenomena which it presents are arising and beginning an evolution which may go on indefinitely. The historical case already when we encounter it "has a past."

Study of the historical case may or may not reveal origins; the data may have been lost. The generative case illuminates as nothing else can the beginnings of things, the process of causation. Generative cases are every day, every hour arising in human society, and to

this fact we owe the possibility that one of these days we shall begin really to understand the nature of our societal activities and relationships; but if we were to study these only we should go far astray in our attempts to understand what processes have in them real promise of continuity and contribution to human well-being. To get knowledge of this latter sort we must learn also, as the historians have learned, how to study with scientific care and precision the historical case.

In point of logic scientific method in history is only an application of those procedures of scrutiny which all sciences avail themselves of to determine fact, and which in earlier pages I have described, but it is an application of them to one class of facts in particular, and it has become highly detailed and technical.

The facts with which history has particularly to do are facts of record, and these are indispensable not only for history in the narrower meaning of the word but also in every domain of science and art, since an observation once made exists thenceforth only as recorded. Therefore, in the systematic accumulation and comparison of observations in any field of scientific study, it is necessary to use or to rely upon the technical procedures of historical criticism.

These procedures comprise, first the discrimination of all secondary sources (including abstracts and paraphrases) from primary sources; second, the discrimination of copies (including both variants and exact transcripts) from originals; third, the analysis of originals into components or elements, any of which may have an alluring history; and fourth, the scrutiny of testimonies recorded.

The critical study of records, documentary and other, variously known as archaeology, paleography and epigraphy, proceeds through the systematic comparison of record with record, or group of records with other groups, in which all perceived differences and resemblances are noted.

Upon human testimony all our inferences and conclusions from narrative and statistical data ultimately rest. When we have discovered that historical or statistical documents are genuine as records, we still have to inquire whether the story they tell is credible.

The scientific sifting of testimony, proceeds by observing resemblances and differences among witnesses, and by grouping or grading them with reference to specific qualifications. Only those witnesses are competent:

1. Whose position in time and space is, or has been such with reference to the alleged

fact, that they can or could have seen or heard it. This throws out hearsay, or secondary testimony, as of secondary value.

2. Who (a) have no motive to falsify, and who (b) are not liars by habit.

3. Who are intellectually competent to observe or to hear and to report accurately; (a) sane and not feeble minded, (b) not under hypnotic control, (c) not under the control of an overmastering passion or interest, and (d) not under the control of a mastering idea or suggestion.

Until recently the challenging and sifting of testimony has been more meticulously, and, now and then, more expertly conducted in courts of justice than elsewhere. Cross examination chiefly has been relied on, and historians have lamented their inability to put dead witnesses on the stand, and to exclude irrelevant and misleading allegations by application of standardized rules. Experimental researches of psychology have now shown that legal procedures and safeguardings are far from satisfactory. Occurrences of which the observers have had no previous intimation have been enacted in the presence of exceptionally competent witnesses, in one instance a congress of psychologists. Their written reports of doings and sayings have been com-

pared with one another and with the unbiased testimony of cinema and dictophone. The revelations of human fallibility have been disconcerting. When truth is what we want, the eye witness must be checked up by circumstantial evidence, as that in turn, must be checked by the eye witness.

CHAPTER VII

THE SIGNIFICANCE OF CASUAL GROUPS

Among casual cases of interest to social workers, social psychologists, and sociologists, are groups fortuitously or incidentally assembled. They are of great number and variety and they offer data of exceptional value to the alert sociologist. An incredible amount of material appears day by day in the newspapers, and most of this goes to waste. It has not been checked up, item by item, and usually it cannot be; but when masses of it are assembled the errors are found to be in the main compensatory: they cancel out. Watch and ward must be kept, to be sure, against errors which instead of cancelling accumulate. Usually something queer or distorted in the picture they present, or in the implication they suggest, gives warning of them.

To collect and distribute this data we must have a suitable device to work with. The schedule here presented will be found to be a serviceable instrument for catching and sorting facts of sociological significance.

The examples are given as filled out by competent persons who analyzed the material, names and dates being omitted. The letter X means "Yes." In the first example the schedule is reproduced in detail and complete.

A RECORD OF PLURALISTIC REACTION

Source
Name of newspaper or other source
Place of publication Date
The situation or stimulus—
Peril of 15 men in a boat in a bad sea
When Where, *a beach* What (describe briefly)
Prearranged Preannounced Otherwise foreseen
Unforeseen *X* Unexpected *X* or anticipated
The reaction
Number of individuals participating—*hundreds*
Counted Estimated *X* Guessed at
Adults only Minors only Adults and minors *X*
Men or boys (or men and boys) only—*chiefly men*
Women or girls (or women and girls) only Both sexes *X*
Colour races (e.g. white, yellow, black) specify—*various*
Nationalities (e.g. Irish, Italian, Polish) specify—*various*
Citizens only Aliens only Citizens and aliens *X*
Religions (e. g. Catholic, Methodist, Jewish) specify—*various*
Occupations (e. g. farmers, bankers, doctors, miners, railroad trainmen, bricklayers) specify—*various*
Reaction spontaneous *X* Reaction promoted by Example *X* Appeal *X* Pressure Drive Bullying Coercion
Reaction Quiet Lively *X* Orderly *X* Disorderly Turbulent Riotous Violent

After each of the following specify whom or what
Interest in—*the rescue of the men*

Recognition or acknowledgement of—*humanitarian impulses*
Repudiation, disavowal, or denial of
Confidence in, belief in
Suspicion, distrust, disbelief of
Sympathy manifested for or with—*the imperiled men, their families and rescuers*
Antagonism manifested against
Countenance of
Discountenance of
Approval of
Disapproval of
Active support of—*rescuers*
Active opposition to
Action Undirected Directed *X*
Action Unorganized Organized *X*

In the next three examples only filled out parts of the schedule are reproduced.

EXAMPLE 2

Situation or stimulus—*eviction of tenants*
Prearranged *X* Anticipated *X*
Number of individuals participating—*700*
Counted *X* Adults only *X* Both sexes *X*
Colour races—*various*
Nationalities—*various*
Citizens and aliens *X*
Religions—*various*
Occupations—*various*
Reaction spontaneous *X* Influenced by pressure *X*
Reaction lively *X* Orderly *X*
Interest in—*protection of home and family*
Recognition of—*protection afforded by court while new quarters were being sought*
Antagonism manifested against—*landlords*
Approval of—*court for tenants*
Disapproval of—*rent increase*

Active opposition to—*rent increase*
Action undirected *X* Unorganized *X*

EXAMPLE 3

Situation or stimulus—*proposed strike*
Number participating—*over 100*
Estimated *X* Adults only *X* Men only *X*
Colour races—*white predominant*
Nationalities—*various*
Citizens and aliens *X*
Occupations—*railway and steamship employees*
Reaction spontaneous *X* Promoted by example *X* By appeal *X*
Reaction quiet *X* Orderly *X*
Interest in—*wages, working conditions, and trade union morale*
Confidence in—*trade union officials*
Sympathy for—*fellow workmen in railroad brotherhoods*
Antagonism manifested against—*railroad and steamship companies*
Approval of—*strike*
Active support of—*strike*
Action directed *X*

EXAMPLE 4

Situation or stimulus—*public discussion of birth control*
Prearranged *X* *Trouble foreseen*
Number participating—*a thousand or more*
Estimated *X* Adults and minors *X* Both sexes *X*
Colour races—*various*
Nationalities—*various*
Citizens and aliens *X*
Religions—*Catholic, Protestant and Jewish*
Occupations—*various*
Reaction
Spontaneous *X* Promoted by pressure *X* By coercion *X*
Reaction Lively *X* Disorderly *X* Turbulent *X*
Interest in—*free speech*

Recognition of—*constitutional rights*
Repudiation of—*police interference*
Confidence in—*worthiness of cause*
Sympathy manifested with—*Mrs. Sanger*
Antagonism manifested against—*police*
Action undirected *X* Action unorganized *X*

One hundred and thirty-one, a number too small to be called a sample, of the numberless possible reports in general like the foregoing, gave the following distribution of stimuli or situations:

Stimulus or Situation	
Minor occurrence of human origin	87
Personal example, appeal or intimidation	16
Insurrection	10
War	8
Natural resources of a geographical place or region	4
Drought	2
Conflagration	2
Storm	1
Epidemic	1
	131

Grouping these frequencies we have: circumstances consisting only or chiefly of human factors, namely, war, insurrection, personal influence and minor occurrences of human origin, 121; circumstances consisting of physical factors only or chiefly, namely, drought, storm, conflagration, epidemic, 6; and regional influences, 4.

No report was complete, and approximately twenty-five percent of all reports were meagre. The 31 most imperfect ones were thrown out, leaving a round 100. These gave the following frequencies: each a percentage:

Composition

Citizens and aliens, both	82
Occupations, various	79
Both sexes	74
Adults and minors, both	70
Religions, various	70
Nationalities, various	67
Colour races, various	42

Character of Reaction

Reaction spontaneous	74
Reaction promoted by example	55
Reaction promoted by appeal	33
Reaction promoted by pressure	10
Reaction promoted by coercion	4
Reaction promoted by bullying	3
Reaction promoted by drive	0
Reaction orderly	55
Reaction lively	45
Reaction quiet	33
Reaction disorderly	13
Reaction turbulent	11
Reaction riotous	4
Reaction violent	4

Attitudes

Instances Reported

Interest in	92
Recognition of	66

Sympathy for or with	45
Approval of	43
Confidence in	43
Active support of	31
Antagonism to	22
Suspicion of	16
Active opposition to	15
Repudiation of	14
Discountenance of	12
Disapproval of	8
Countenance of	7

Action

Action directed	48
Action unorganized	46
Action undirected	44
Action organized	41

From the foregoing distributions it appears that of 100 miscellaneous assemblages more than fifty percent were homogeneous in respect of colour race, but not fifty percent were homogeneous in respect of nationality. They were most heterogeneous in respect of the commingling of citizens and aliens, and of occupations, less heterogeneous in respect of age, sex and religion.

Reaction was on the whole spontaneous (an approximately simultaneous like response to a common stimulus or situation) but in more than half of the instances it was stimulated also by example. Pressure, coercion, bullying and drive played little part. Behaviour was

usually orderly; infrequently disorderly or turbulent; very infrequently riotous or violent.

Attitudes were distinctly positive, twice as often expressing sympathy for or with somebody or something as antagonism; almost three times as often expressing confidence as suspicion; three times as often approving as repudiating; more than five times as often approving as disapproving.

In more than half of all instances action was not seen to be directed or organized.

A college or university class is a casual group, not fortuitous, but assembled as an incident and by-product of the like behaviour of unacquainted individuals who have come from far and near in the pursuit of like interests and ambitions. It yields data of societal psychology more detailed and exact than that afforded by newspapers.

From the registrar's office an instructor receives registration cards or lists. The registrations are tentative, but for the moment the number of them is an exact measure of a multi-individual reaction to a common stimulation. Presently some of the registered individuals drop out; the others stick and the instructor then has two more precise measures, namely, the percentage which the persisting responses

are of the whole number of responses, and the ratio of the persisting responses to the non-persisting ones. When lectures and class exercises are under way differing responses to a common stimulus or situation begin to multiply, and many ratios of like to unlike responses become available.

The following examples of societal data of academic casual groups are actual numerical distributions obtained from graduate classes in sociology at Columbia University.

Kin-neighbours in Childhood

The students composing these groups have been of both sexes, of various races, and nationalities, of differing religious faiths, and of miscellaneous experiences; but most of them have had one common experience in childhood. They have lived among kindred, and presumably their reactions have been conditioned by kindred.

The members of a class were questioned and instructed:

1. How many persons of your immediate kindred, but not members of your household were your near neighbours during any part of your childhood?

2. How were the neighbouring kindred distributed in relation to you? Distinguish

cousins as first, and more distant than first, and state number of each. Distinguish uncles, aunts, and grandparents as paternal or maternal, and state number of each.

Reports from 42 writers gave the following frequencies:

Distribution of Kinships

Total number of neighbouring kindred	882
Cousins more distant than first	404
First cousins	232
Paternal uncles	44
Maternal aunts	41
Paternal aunts	40
Maternal uncles	36
Paternal grandfathers	16
Maternal great aunts	15
Maternal great uncles	15
Paternal grandmothers	11
Maternal grandmothers	10
Maternal grandfathers	9
Paternal great uncles	4
Paternal great aunts	4
Paternal great grandmother	1

Changes of Residence

However numerous the relatives that one may have about him in early childhood he usually "moves" sooner or later, and in America most families go from one home to another. College and university students and their families are not exceptions. A class was instructed:

Make a list of instances when you, or members of your immediate family have voluntarily made a change of residence to another place. Let the term "place" be understood to mean neighbourhood, village, town or township, city, state or country.

Array of Changes[1]

Times	Persons	Totals
0	3	0
1	0	0
2	9	18
3	7	21
4	7	28
5	5	25
6	0	0
7	3	21
	34	113

The following reasons for change were stated: For advantage created by man, 65; for advantage of physical environment, 26; to escape disadvantage created by man, 16; to escape disadvantage of physical environment, 6.

Habits

Social and societal reactions are determined in part by hereditary prepotencies, in part by

[1] The numbers here given are too small to be of statistical significance, but the table is a pattern for what might be an important inquiry, and is presented as such.

habits, in part by crises, in part by other situations, including the form and action patterns that we have to fit into. Whether any one of these groups of factors is more effective than another we do not at present know, but habits are unmistakably important. They are disclosed with little reserve in recreational and in religious activities. A class was requested to answer the following questions:

As nearly as you can remember, or can calculate from weekly averages, how many times a year do you:

1. Play a physical exercise game, for example, tennis, golf, or billiards?
2. Play a mental exercise game, for example, whist or chess?
3. Read through or attempt to read through a new novel?
4. Go to the theatre?
5. Go to a concert of vocal or instrumental music?
6. Go to church?

Replies by 71 individuals gave the following distributions:

Times Grouped

Physical Exercise Game		Mental Exercise Game		Novel	
Times	Frequency[2]	Times	Frequency	Times	Frequency
0— 24	31	0— 24	42	0— 2	16
25— 49	15	25— 49	17	3— 5	25
50— 74	5	50— 74	4	6— 8	9
75— 99	4	75— 99	1	9—11	7
100—124	3	100—124	1	12—14	5
125—149	3	125—149	0	15—17	0
150—174	6	150—174	3	18—20	4
175—199	1	175—199	1	21—23	0
200—224	1	200—224	0	24—26	2
225—249	0	225—249	0	27—29	0
250—274	1	250—274	1	30—32	0
275—299	0	275—299	0	33—35	0
300—324	0	300—324	1	36—38	0
325—349	0			39—41	0
350—374	1			42—44	1
				45—47	0
				48—50	2
Total	71	Total	71	Total	71

[2] "Frequency" here means number of individuals reporting the given number of times.

Theatre		Concert		Church	
Times	Frequency	Times	Frequency	Times	Frequency
0— 4	20	0— 4	22	0— 24	25
5— 9	19	5— 9	21	25— 49	12
10—14	13	10—14	13	50— 74	14
15—19	4	15—19	7	75— 99	9
20—24	7	20—24	3	100—124	6
25—29	1	25—29	0	125—149	3
30—34	2	30—34	0	150—174	1
35—39	0	35—39	1	175—199	0
40—44	1	40—44	1	200—224	0
45—49	0	45—49	0	225—249	0
50—54	3	50—54	2	250—274	0
55—59	0	55—59	1	275—299	0
60—64	0			300—324	0
65—69	0			325—349	0
70—74	0			350—374	0
75—79	1			375—399	1
Total	71	Total	71	Total	71

Folk-ways and Mores of Early Situations

To a great extent habits and attitudes are formed by the folk-ways and mores of the communities in which childhood and youth are passed, and by the approvals and disapprovals of them by persons who attend to our "bringing up."

The following inquiry brought forth 117 reports.

What social gatherings, collective amusements, festivals and celebrations that you attended, saw, or heard about in your childhood and youth were disapproved by the persons who had most to do with your bringing up?

	Number of Disapprovals Reported[3]
Drinking bouts	100
Beer parties	95
Dice and card parties	79
Smokers	64
Prize Fights	63
Dancing class	57
Masquerade ball	50
Pumpkin and fruit stealing raids	44
Theatricals	40
Pigeon shooting	39
Barn dance	36
Dog fights	36
Cake walk	35
Hazing	35
Visiting gypsy encampment	34
Horse race	32
Turkey raffle	32
Cock fights	31
Turkey walk	30
Hunt ball	25
Circus	24
Minstrel show	24
Medicine show	23
Street carnivals	20
Boxing matches	19
Hallowe'en party	19
Opera	19

[3] No item is listed which did not appear in as many as ten reports.

Snake charming	17
Frog hunting	15
Bull fights	13
New Year's Eve Festivities	13
Shooting matches	12
Election night street assemblages	11
Mock marriages	11

Simultaneous Reactions to Fortuitous Situations

The beginnings of societal behaviour are revealed in spontaneous simultaneous reactions to fortuitous situations. The situations of most frequent occurrence reveal the character, habits and state of the community in which the reactions occur.

A class was requested and instructed:

Make a list of occasions when you, with ten or more other persons, have unexpectedly hurried to a particular spot. State the occurrence or incident that attracted you in each instance. Group your instances under the following three heads: 1. Of serious concern to the community; 2. of serious concern to an individual; 3. of minor importance.

Replies by 110 individuals gave the following array of occurrences of serious concern to the community:

Occurrences: Number of Each Kind	
Fires	367
Fires threatening entire quarter of city	98

Forest fires	86	
Fires threatening to throw large proportion of local population out of employment	71	
Fires threatening an entire village or town	66	
Prairie fires	46	
Floods		99
Riots		89
Arrival of relief or rescue to a local population or other considerable group in distress or danger		40
Accidents bringing mourning, suffering or loss to a large proportion of a local population		37
Tornadoes		36
Incidents of war bringing mourning, suffering or loss to a large proportion of a local population		30
Insurrections		13
Approach of armed enemy		8
Earthquakes		6
Disturbances incident to serious strikes		6
Lynchings		3
Invasions of insect pests causing widespread loss		2
		736

Replies from 115 individuals gave the following array of occurrences of serious concern to an individual or to individuals:

Occurrences: Number of Each Kind

Fires, not including those listed in foregoing array		749
Arrests or police interferences		53
Accidents		504
Serious but not fatal	324	
Fatal	180	
Crimes not amounting to riot or insurrection		212
Trespasses		120
Shipwrecks, without fatality, or ship or boat in distress		

and not included under "minor accidents" below	77
Sudden deaths (not included under fatal accidents)	74
	2469

Replies from 115 individuals gave the following array of occurrences and incidents of minor importance:

Occurrences: Number of Each Kind

Spectacles, including parades	948
Street speaking	883
Storms, sending people to shelter	786
Street diversions including street music	777
Celebrations	768
Proclamations or bulletins	756
Accidents, minor (not involving death or serious injury and not including "shipwreck" above, or "explosion" or "runaway" below)	662
Fights, human beings	647
Crowd actions, not amounting to riot or insurrection	626
Presence or behaviour of drunken persons	623
Presence of celebrities	601
Fights, animals	558
Absurd or ridiculous incidents	459
Runaway horses not causing death or serious injury and not included under "minor accidents" above	428
Sudden illnesses	277
Threats or hostilities not resulting in death or serious injury	177
Explosions not causing death or serious injury and not included under "minor accidents" above	112
Other incidents	159
	10,247

The Consciousness of Kind

A casual group usually yields data for a study of the consciousness of kind; a university class always does.

The following inquiry indicates that within the limits of the same colour race reaction to such physical similarities and dissimilarities as eye colour (dark or light), colour of hair, and complexion, is too slight to be significant.

The questions were:

1. Among acquaintances of your own sex how many persons do you habitually think of as your "best friends?"
2. Of these "best friends" how many are unmistakably like you in colour (dark or light) of eyes?
3. How many are unmistakably unlike you in colour of eyes?
4. How many are unmistakably like you in colour of hair?
5. How many are unmistakably unlike you in colour of hair?
6. How many are unmistakably like you in complexion?
7. How many are unmistakably unlike you in complexion?

Replies from 98 individuals gave the following distribution:

Physical Traits of Best Friends

Number of best friends		613
Eyes like own	220	
Hair like own	258	
Complexion like own	258	
Total like traits		736
Eyes unlike own	249	
Hair unlike own	275	
Complexion unlike own	258	
Total unlike traits		782

The next inquiry indicates that reaction to similarities and dissimilarities in taste, in ideas and beliefs, in manners, and in morals is unmistakably significant.

The instructions were:

1. Write down a list of names of persons of your own sex who were your school mates or college mates, and for whom you had, as a rule and on the whole, a positive liking. Call it list "A."

2. Write down a list of names of persons of your own sex who were your school mates or college mates and whom, on the whole, you more or less disliked. Call it list "B."

3. Make the lists of even number by striking off names from the longer list, first a name from the bottom, then a name from the top, and so proceeding.

4. Comparing the lists note whether in list "A" or in list "B" you find more persons like yourself (1) in manners, (2) in morals, (3) in tastes, (4) in ideas and beliefs.

Reports by 113 individuals listed 1328 names. Acquaintances similar to the reporters were distributed as follows:

Relative Numbers of Persons Like Self in Lists A and B

Taste	
More acquaintances like self in list A, reported by.....	100

Acquaintances like self in list A and in list B equal in number, reported by	9
More acquaintances like self in list B, reported by	4

Ideas and Beliefs

More acquaintances like self in list A, reported by	99
Acquaintances like self in list A and in list B equal in number, reported by	11
More acquaintances like self in list B, reported by	3

Manners

More acquaintances like self in list A, reported by	93
Acquaintances like self in list A and in list B equal in number, reported by	14
More acquaintances like self in list B, reported by	6

Morals

More acquaintances like self in list A, reported by	88
Acquaintances like self in list A, and in list B equal in number, reported by	20
More acquaintances like self in list B, reported by	5

A third inquiry brought out a discriminative reaction to nationalities. The instructions were:

Suppose that immigrants of the various nationalities were to be admitted into the United States in proportion to the number of votes that each nationality should receive in a referendum balloting, to be conducted as follows:

1. The Federal Government to print and distribute a list of nationalities to be considered and acted upon.

2. Each voter qualified to vote in Federal elections to be permitted to cast 100 votes, and to distribute them, in accordance with his own preferences, among the nationalities of the printed list; except that he would be directed to cast at least one vote for each nationality listed, and instructed that he must not bunch more than 25 votes upon any one nationality.

Subject to the foregoing circumstances and conditions how would you distribute 100 votes among the following nationalities:

Seventy individuals distributed 7000 votes as follows:[4]

Preferences for Nationalities:	Distribution		
English	603	Bohemians	152
Germans	534	Finns	139
Scotch	450	Greeks	129
French	407	South Americans	127
English Canadians	398	Hungarians	115
Irish	362	Spaniards	114
Dutch	353	Rumanians	113
Swiss	299	Armenians	112
Swedes	291	Slavs	103
Norwegians	272	Portuguese	100
Welsh	267	Bulgarians	97
Danes	261	Syrians	90
French Canadians	214	Cubans	87
Austrians	203	Turks	86
Italians	187	Mexicans	85
Russians	167	Arabs	83
		Total	7000

[4] A list of nationalities was given out.

Reactions to Mores

Attitudes toward the approved manners and morals of a community, commingled with aversions and prejudices, appear in avoidance reactions to persons.

A list of disqualifications, alphabetically arrayed, for which a candidate for admission to a club might be blackballed, was given out. The question and instructions were:

Suppose a group or club of persons of your own sex formed and maintained solely for agreeable social intercourse among its members. It has no other purpose or significance whatever. As a member of such a group, for which of the following disqualifications would you vote against the admission of a proposed new member?

A total of 1457 adverse votes was cast by 96 individuals. The smallest number, 5, was cast by one voter only, and the largest number, 24, by one voter only. The modal numbers, 14 and 15, were cast each by 14 voters. Distributions follow.

Array of Adverse Votes

Notorious cruelty	94
Dishonesty	90
Vulgar conversation	90
Uncleanliness	83
Quarrelsomeness	83

Incivility	82
Loud conversation	81
Self-assertion	80
Profane conversation	79
Frequent lying	79
Stupidity	79
Intoxication	79
Sexual immorality	78
Fault finding	74
Habitual gambling	74
Habitual borrowing	65
Advocacy of lawlessness	47
Colour	45
Ungrammatical speech	24
Atheism	18
Dress shabby	10
Physical deformity	8
Inability to write correct letter	7
Nationality	5
Religion	2
Wage-earning	1
Political affiliations	0

Array of Adverse Votes by Men

Notorious cruelty	74
Dishonesty, money	73
Vulgar conversation	71
Quarrelsomeness	67
Frequent incivility	67
Personal uncleanliness	67
Annoying self-assertion	66
Loud and uncouth conversation	64
Frequent lying	63
General stupidity	63
Profane conversation	62
Sexual immorality	61
Frequent intoxication	60

Habitual fault finding	60
Habitual gambling	57
Habitual borrowing	53
Open advocacy of lawless measures	38
Colour	35
Ungrammatical speech	17
Atheism	17
Dress shabby	10
Physical deformity	7
Inability to write correct letter	6
Nationality	5
Religion	2
Wage earning	1
Political affiliations	0
	1166

Array of Adverse Votes by Women

Notorious cruelty	20
Frequent intoxication	19
Vulgar conversation	19
Profane conversation	17
Loud and uncouth conversation	17
Dishonesty, money	17
Sexual immorality	17
Habitual gambling	17
General stupidity	16
Personal uncleanliness	16
Frequent lying	16
Quarrelsomeness	16
Frequent incivility	16
Annoying self-assertion	14
Habitual fault finding	14
Colour	10
Open advocacy of lawlessness	9
Ungrammatical speech	7
Physical deformity	1

Inability to write correct letter	1
Atheism	1
Nationality	0
Religion	0
Wage earning	0
Dress shabby	0
Political affiliations	0
	291

Social and Societal Interests

All normal persons in youth develop social and societal interests. Those developed by college and university students are numerous and varied. They are not the same, however, in all groups and at all times.

The first of the following distributions was obtained from a Columbia University seminar before the European war.

The question submitted was:

If you were compelled by public opinion, or otherwise, to work seven days in each year in aid of a social reform, or welfare enterprise, six days in aid of a second one, five days in aid of a third one, and so on down to one day of enforced service, to what reform or welfare work would you give the seven days, to what the six days, and so on?

Replies simultaneously written by 18 individuals distributed a total of 462 days as follows:

Distribution of 462 Days

Education	81
Political Reform	62
Labour Movement	57
Charity	53
Health	46
Religion	42
Ethical Development	29
Public Recreation	24
Better Housing	16
Combatting Criminality	15
Discovery of a Better Social Order	7
Promoting a Better Social Order	6
Eugenics	6
Opposing Socialism and Anarchy	5
Civic Improvements	4
Pure Food	4
Federal Control of Marriage and Divorce	4
Distribution of Immigrants to Agricultural Sections	1

The second distribution was obtained a few days later from a lecture class. The question submitted was:

How would you distribute $100 among as many as ten and not more than twenty causes in which you feel interested?

Replies simultaneously written by 106 individuals distributed $10,600 as follows:

Distribution of $10,600

Education	$ 1009
Prevention of Diseases	927
Improvement of Living Conditions	917

Child Protection	908
Scientific Research	892
More Equal Distribution of Economic Products	709
Religion	615
Relief of Sick or Injured	613
Art or Music	567
Temperance	543
Relief of Destitution	542
Reform of Law and Procedure	522
Prevention or Suppression of Crime	506
Reform of Political Activities	501
Suppression of Vice	490
Prevention of Cruelty	339

Concurrent Decision

In communities in which questions of public policy are talked about, discussed, mooted, concurrent decision is arrived at by voting.

Many individuals may agree in one decision or purpose, not many individuals in many decisions or purposes. Therefore a frequency distribution of the votes of many individuals on many questions at one time under consideration, is normally modal, and probably normally a skew.

These *a priori* presumptions find support, good as far as it goes, in the following frequency distribution. A list of 60 proposals taken from legislative calendars and party platforms and alphabetically arrayed was given out, and a

class was asked to write "Yes" or "No" against each.

A total of 2562 votes was cast by 82 individuals. The frequency distribution was:

Frequency Distribution of Votes on 60 Proposals

Yes Votes	Cast by individuals numbering	Total
17	1	17
18	0	0
19	2	38
20	0	0
21	0	0
22	0	0
23	0	0
24	3	72
25	4	100
26	4	104
27	1	27
28	3	84
29	7	203
30	4	120
31	8	248
32	5	160
33	13	429
34	7	238
35	9	315
36	3	108
37	5	185
38	3	114
	82	2562

Social Coöperation

With few exceptions graduate students have participated in social coöperation.

A list of 25 social activities, alphabetically arrayed was given out with this question:

In which of the following kinds of effort in behalf of miscellaneous individuals or of a group, or of a class, or of the general public, have you at any time participated with as many as ten other persons for a period of 30 or more days in the aggregate?

Go over the list of activities in which you have so participated and under each item state whether your coöperation has been strictly voluntary, or has been with a conscious sense also that it was expected of you by your associates or by the community, or because of your own desire or sense of duty, and also because it has been expected of you.

Replies by 116 individuals gave the following distributions:

Distribution of Participants

Educational	97
Religious	90
For promotion of science, literature, art or music	68
For relief of destitution	44
For development of social amenities and opportunities	37
For development, reform or safeguarding of amusements and recreation	32
For relief of sick or injured	29
For prohibition	27

For economic betterment of a group, or of a class, or of the whole population	27
For prevention of destitution and pauperism	25
For child protection and conservation	24
For promotion of temperance, but not by prohibition	24
For development, or strengthening, or reform of family life	23
For the development or reform of political activities or methods	21
For municipal development or reform	20
For a more equal distribution of economic product	18
For better housing	17
For suppression of vice	17
For prevention or suppression of crime	13
For the development or reform of government, legislative or administrative	11
For better housekeeping	10
For the promotion of justice	10
For the development or reform of public or private law	8
For the prevention of cruelty	7
For the conservation of natural resources	6

Character of Participation: Number of Instances

Voluntary	468
Expected	29
Voluntary and expected	129
Undistributed	79

Societal Coöperation

Through membership in various organizations graduate students with few exceptions participate in societal coöperation.

Reports by 106 individual members of one class showed a distribution of memberships in organizations as follows:

Membership in Organizations

Members of alumni associations	87
Members of churches	79
Members of philanthropic organizations	59
Members of college fraternities	47
Members of societies for fostering scholarship	35
Members of societies for fostering literature	25
Members of societies for fostering science	21
Members of general fraternities	17
Voting members of business corporations	17
Members of societies for fostering art or music	12
Members of political clubs	11
Members of granges	3
Members of trade unions	2

Probability of Concerted Action

A considerable number of "same" individuals is normally found in the membership of three or four or more groups, thereby constituting a solidarity. The greater the solidarity the higher is the probability of concerted action.

Solidarity

Of the 106 individuals who reported membership in organizations there were citizens of the United States	95
Of the 95 there were born in the United States	89
Of the 89 there were voters	58

Of the 58 there were affiliated with a political party..... 34
Of the 34 there were Protestants..... 31
Of the 31 there were church members..... 30

What, now, is the significance of this material? What is the significance of casual groups?

It is coterminous with sociology.

First. All casual groups present to observation a *fundamental societal pattern*, and so clearly that there can be no mistaking what that fundamental pattern is.

Always the group is composite, not only in the sense that it is made up of individuals, but also in the sense that it is composed of kinds or categories of individuals. It is never strictly homogeneous, and never as heterogeneous as theoretically it might be; and the variability between these limits is very great.

The situations to which casual human groups respond in behaviour have more often been created by man than by physical nature for him, whereas the situations to which swarms and herds of gregarious animals respond have in general been more often created by physical nature than by their own behaviour, but whether this is true of all species or not we need careful studies to determine.

In the reactions of casual groups to situations a spontaneous and approximately simultaneous multi-individual response is basic, but it is complicated by interstimulation and response, particularly by example and imitation.

A consciousness of kind is always discoverable, and usually is obvious.

Folk-ways and mores are usually in evidence, and reactions to them. Social interests are manifest, and so are tendencies toward concurrent decision and coöperative activity.

Second. The form and action patterns of casual human groups are of great variability and *the variabilities can be measured.* Usually these groups are too small to serve as adequate samples of human society in the large, but the measures which they yield are highly suggestive, and point the way to investigation.

If by adequate expenditure of time and money true samples could be obtained of societal factors and behaviour substantially similar to the instances that have here been presented, and if the measures which they would yield should be found to be like these measures and proportional to them, what conclusions, or general truths of sociology, would appear? For the present I content myself with naming four.

1. Group behaviour is determined in part by the relative heterogeneity of group components.

2. The ratio of situations created by man to situations created for him, to all of which human society reacts, is a measure of societal attainment. I do not know that anyone has ever proposed to use this ratio as a measure of progress. I think that, in the nature of things, it is a cultural distance measure (from animal to civilized *homo sapiens*) and that perhaps it is the best one that we shall ever get.

3. The form of a statistical array indicates the degree of pressure to make them equal to which its items have been subjected. As I have elsewhere shown,[5] the ratio obtained by dividing the difference between the largest item and the smallest by the number of items is a measure of equalizing or standardizing constraint. The greater this ratio, the more closely does probability approach certainty that chance has been at work: that the phenomenon which we are studying is largely a product of a multiplicity of small causes. The smaller the ratio is, the closer does probability approach certainty that a specific force has been at work to flatten and equalize. Societal

[5] "The Service of Statistics to Sociology," *Publications of the American Statistical Association*, March, 1914, and *vide* Chapter XII.

pressure has been increasing, as everybody feels, but it has not yet created an intolerable uniformity. A look at the arrays which have been presented will satisfy the reader that multi-individual behaviour is exceedingly variable, and that chance still coöperates with human purpose.

4. In human society concurrent decision, as our folk-way is, and, in democracies, our law, is the agreeing vote of more than half of the individuals voting; and, as a rule, a really effective coöperation requires the efficient actual participation of more than half of the individuals nominally "standing for" the enterprise. Therefore, the possible extent of collective decision and of effective coöperation in human society is measured by the number of matters upon which more than one half of all actively participant individuals agree. In the foregoing distributions more than one half of all group units agree upon more items of manners and morals than matters of social interest, or questions of public policy. The mores are stronger than reforms, and, somewhat surprisingly, men are in closer agreement upon manners and morals than women are.

A fifth generalization will be presented in the next chapter.

CHAPTER VIII

SOCIETAL TELESIS

The earliest discussion of the nature of human society of which we now have record is found in the *Laws* of Plato. Whether it occurred actually or only imaginatively, in Plato's head, nobody knows, and it does not matter. Either way it states the three possible hypotheses: (1) that human society is a divine institution and is "run" by the gods for their own purposes; (2) that it is artificially created by man for his purposes; and (3) that it is a natural product of fortuitous factors and impersonal processes. The general conclusion at which the disputants arrived was that customs and laws express an objective conditioning of individual and collective life by fortuitous forces to which man must accommodate his conduct. "The law-making of man they viewed as essentially the art of perfecting this accommodation of human conduct to objective facts and relations."[1]

With variations this view has persisted for more than two thousand years and the varia-

[1] Giddings, *Studies in the Theory of Human Society*, p. 94.

tions that may be discovered in the writings of present-day sociologists do not greatly differ in kind or in degree from those which may be found in discourses on political theory from Aristotle to Rousseau. Montesquieu saw human volition controlled by physical conditions. Comte saw physical conditions altered, adapted, and utilized by man through historical and political processes. Spencer contended that society arises as the culminating product of a natural and universal process of evolution, in which, however, he found room and function for conscious human purpose and coöperative effort. This effort he thought most effective for good while it remained voluntary and plastic. Legislation he distrusted, as likely to be more mischievous than useful.

Lester F. Ward, inspired by Comte, developed the large conception that human society in its evolution arrives genetically at a point where it becomes intellectually self-determining, and thereafter proceeds to work knowingly toward the realization of visualized ends. Accordingly, a telic process determined by ends supersedes a merely genetic process determined by antecedents. Following Comte's inaccurate use of the words "static" and "dynamic," Ward misleadingly called his first great work *Dynamic Sociology*.

A title, "Teleological Sociology," or an equivalent, would have been more accurately descriptive, and would have better focussed attention upon Ward's chief contention.[2]

The study of societal phenomena by statistical methods has now, for those who understand them, terminated controversy over this hoary question of societal self-determination by demonstrating that the societal process is telic as well as fortuitously and physically evolutionistic.

The demonstration is given in the prevailing type of frequency distribution of societal occurrences. These do not plot as the straight lines or precise geometric curves of coördinate motion, in which there is no room for choice, nor yet as the normal frequency curve of chance happenings. They plot instead as curves of the skew type, indicating not only the presence but also the positive influence of factors which drive in certain directions toward recognizable ends. That some of these are conscious intents or purposes which drive

[2] More than most writers Ward has suffered at the hands of indiscreet and ill-informed disciples who, for their own purposes, have appropriated those parts of his system which are demonstrably untrue, in particular his Larmarckian biology and his gynecentric anthropology. He deserves a better fate. His true generalizations are abundant, substantial and important.

toward ends in view (a telic process) is distinctly shown in the frequency distribution of collective decisions. This is the fifth generalization from such data as were presented in the preceding chapter, which was there promised.

Therefore it is necessary in a comprehensive scientific study of human society to scrutinize the telic process no less than the synthetic co-working of *vires a tergo*. We must attempt to construct the societal teleology. We must discover, if we can, what visualized ends are alluring enough to call forth effort, and the normal succession (if there is one) of alluring ends. We must observe the various form and action patterns of effort, and how each is related to ends in view. Presumably there is a development of patterns through trial and selection, and therefore a normal succession and improvement of methods constituting the telic process, and this if possible we must ascertain. And to round out the study we must inquire how a rational telesis is related to a mechanistic evolution. Does conscious effort to attain visualized ends truly supersede a blind genetic trend, or is telesis but a conditioned and projected genesis, as genesis is but a conditioned and projected drive of equilibrating physical energies?

The few and simple visualized ends which move simple, ineffective minds comprise little beyond the preservation of life and some amelioration of the struggle for existence. To more vigourous, but not necessarily more intellectual natures, power, and opportunity to exercise it, make strong appeal. The excitements and emotional pleasures incidental to social contacts are "life" for multitudes. Knowledge, individual development, and race improvement, are ends visualized by exceptional men and women in the so-called advanced civilizations. There is, therefore, a normal gradation, whether or not there is a normal succession, of action-provoking ends in view.

Conscious efforts to achieve visualized ends are made by individuals, by small social groups and sodalities, by societal groups, blocs and classes, and by sovereign states. By each of these agents effort is directed upon itself and upon all agents, namely, individuals, small and large groups, sodalities, blocs, classes, and sovereign states. By each and all it is directed upon conditions deplored but believed to be remediable, which are pervasive throughout society, and upon conditions which it is desired to make pervasive. By each and all it is directed also upon status, which has been

created by government but is objected to or is believed for any reason to call for change. This, in bare outline, is the form pattern of societal telesis.

The action pattern, in similar outline, shows these features, namely: (1) rude impulsive struggle which often becomes violent and revolutionary, by individuals, groups, blocs, and classes; (2) systematic and orderly work, chiefly by individuals and small social groups; and (3) scientifically planned and systematically executed societal engineering.

The characteristic development of the telic process at any given time, and in any designated place, is determined by the selected and prevailing telic action pattern. The selection is determined by mentality, knowledge, and circumstance.

The trend of the telic process is normally from rude struggle towards societal engineering.

Visualized ends are not fortuitous phenomena; they are products of the experiences of human beings who live and whose forbears have lived in society. The methods followed and relied on to attain or "realize" ends are products of trial and selection worked out under past and existing societal conditions. Therefore, beyond question, the telic process

in society is continuous with the genetic. Presumably it is a projection of the genetic rather than a substitution for it, and cannot in even a figurative sense be said to supersede it.

Remembering that effort for the attainment of ends in view is made and brought to bear by agents of every societal category, namely, individual, group, sodality, bloc, class, and sovereign state, it is convenient to scrutinize the telic pattern in detail by observing what efforts, to realize what ends, are brought to bear upon the individuals and component groups (families, neighbourhoods, villages, cities, and so on) of which human society is made up; are brought to bear, further, upon the pervasive conditions (sickness, injury, illiteracy, ignorance, deficiency and so on); and brought to bear, finally, upon status, of children, women, the married and divorced, the hired, the convicted, the alien, and the citizen. Details of method are best observed in immediate connection with details of pattern.

There is cross classification here, and relations are best indicated in tabular diagrams which follow.

THE TELIC FORM PATTERN

Effort in behalf of	Individuals	Families	Neighbourhoods	Villages	Cities	Sovereign States
Bearing upon						
Pervasive conditions						
Sickness						
Injury						
Illiteracy						
Ignorance						
Deficiency						
Inadequacy						
Insanity						
Delinquency						
Vice						
Crime						
Unemployment						
Exploitation						
Misery						
Degeneration						
Status of						
Children						
Women						
The married and divorced						
The hired						
The convicted						
The alien						
The citizen						

THE TELIC ACTION PATTERN

Agent or Agency	Individual	Social	Societal	Governmental
Method				
Rude struggle				
Occasional help or counsel				
Systematic work				
Engineering				

That individuals should put forth effort to attain ends which they think worth while to themselves, is an occurrence which hardly calls for explanation. There is no great mystery either about instinctive caretaking of offspring by parents, animal or human, or about impulsive acts,[3] or acts that spring from a desire to meddle or dictate. But why, *as a matter of deliberation*, that is to say of reason, should one individual exert himself in behalf of another? The answers to this question which theologians, philosophers, and sentimentalists have offered have been little better than side-steppings. They have told us why (in the opinion of those who have done the

[3] Altruism, along with play and deviltry, is at bottom a discharge of superfluous energy. It is an impulsive generosity, overlaid and conditioned by ethical reflection, not originating in it.

telling) everybody *ought* to do helpful things for and improving things to his fellowman, but they have never yet told us why anybody *does*. Such answers as we have to the question of fact we get from ethnology and sociology, and it is less flattering to human nature than the ethical imperative of the philosophers is to spiritual conceit.

When we do things to or for our fellow beings not instinctively, or impulsively, or to gratify a desire to meddle, but *rationally*, we are trying to realize visualized ends. The original or primary ends in view when this undertaking begins are simple and egoistic. They are, first, to make those with whom we have contact and dealings, harmless; that is to say innocuous; second, to make them unobjectionable, at least not obnoxious; and, third, to make them not burdensome.

The savage believes that everybody is liable to be infected by an evil mana which is contagious, or to be "possessed" by a malicious spirit, and the primary purpose of initiation ordeals, to which youths are subjected, is to rid them of contamination and "possession," and magically to make them safe for the future. The barbarian, who has arrived at the conception of deities, watches the attitudes and behaviour of both youths and adults whom he

mercilessly holds to account for acts which might bring divine wrath upon the tribe. Civilized men wash and vaccinate children, vaccinate and otherwise innoculate adults, and penalize teachers who inculcate Darwinism. Pagan and Christian parents chastise offspring for disturbing the domestic peace. Sophomores haze insufferable freshmen, regiments "rag" the raw recruit, and communities, here and there, now and then, punish hoodlumism. Savages teach youths to take part in the food quest, the magical rites, and the common defense, and relegate boys who cannot or do not make good in these activities to the ignominy of female attire and life "at home" with the women. Crude civilizations inflict cruel punishments upon vagabondage, begging, loitering and loafing. More enlightened civilizations undertake to train and stimulate the unambitious and the ineffective to self-supporting activity.

It is only after these primary ends have been pursued a long while that the secondary ends which we call "values" are slowly visualized and begin to influence conduct. The first reactions to this influence are attempts to make individuals of value to the community, directly, or as offerings to a god, or as slaves to a ruling house or class. War is the first

revealer of the immediate value of individuals to tribe or nation. Their direct economic value begins to receive attention with the rise of commerce, and to be acutely visualized under competitive industry. A possible intellectual value is visualized in high civilizations by the few who grasp the importance of discovery and invention. Not until late in human evolution is there any considerable and earnest attempt to make individuals of value to themselves. This value is secular and democratic. As a concept it cannot arise while mankind believes that "the chief end of man is to glorify God," and that the lowly should be content in a station in life to which it has pleased the quality to call them. It is born of revolt, and is nurtured by the idea, sprung from physiological knowledge, that the object of life is to perpetuate itself, that the business of an organism is to function, and that the intelligible end of rational and reasoning man is to improve his mental functioning and thereby to deepen his joy in life; an improvement which presupposes improvement of his physical functioning and a large acquisition of knowledge.

Change in character and behaviour which is brought about intentionally and by effort consists in a physical and mental reconditioning. There are substitutions of new stimuli

for old and a resulting development of new habits. The methods of reconditioning that are witnessed in savagery and in the lower culture strata of civilization, partake of the nature of rude struggle, and at best are random experiments in trial and selection. They involve threats and punishment and appeal to fear. Early systematic methods are religious, and they are closely followed by military disciplines. Systematic secular education, when it appears, marks a momentous advance. It is attempted when discovery and accumulating knowledge have begun to impress imagination and to affect judgment. It reacts stimulatively, and presently with irresistible drive upon new discovery and a further accumulation of knowledge. Physiology and psychology have now contributed two further methods, strictly modern, and of the utmost value. One is vocational guidance, a different thing altogether from vocational training. The other is physical and mental hygiene, which conserves and draws upon the sources of vigour, health, sanity, and poise. It strives to establish correct habits, and to awaken a sense of responsibility, to eliminate groundless fears, to break down emotional complexes and obsessions, to coördinate behaviour and ideas, and to substitute realistic for wishful and fantastic think-

ing. These new methods are destined to react radically upon the ways and programs of systematic education.

Work upon individuals and for them, restraining, disciplining, and reconditioning them, is put forth in personal efforts by unattached individuals, by intimate groups and minor associations, by churches, by such societal organizations of world-wide extent as Boy and Girl Scouts and Young Men's and Young Women's Associations of various religions, and by sovereign states which maintain public schools and higher educational institutions. In all of it there is a varying reliance upon individual initiative and responsibility, on the one hand, upon organization, on the other.

Sporadic action against objectionable families and helpful effort for them are presumably as old as the family itself. Obnoxious families are reprimanded, shunned and banned, as obnoxious individuals are, and have been since days of savagery. The recurring crises of birth and death have evoked spontaneous sympathy and assistance from kindred and acquaintances. "The good neighbour" has always functioned now and then. With the rise of priesthoods and of landed estates, oversight and assistance began to be more systematic. The priest and, in Protestant communities, the minister, have

advised, counselled and restrained. The landlord's wife and daughter were perhaps the first "friendly visitors." Today we have a secular and democratic expansion of these activities, and systematic undertakings by societal organizations and by states. The work attempted, and, in increasing measure achieved, is varied and graduated to a degree. It deals with emergencies and needs; with housing and other living conditions; with habits and morale; with opportunities and possibilities.

Local and civic pride are old. Parish interests have long been looked after (in a way) by the Christian Church and its missions, but systematic effort to improve neighourhoods, villages, towns, and cities, is a recent phenomenon. The first effective impulse to it was given by Arnold Toynbee's neighbourhood house in East London. This impulse was reinforced by the University Settlement (men) and by the College Settlement (women) in New York. Similar centers of neighbourhood influence under all manner of auspices have multiplied rapidly, until now the count of neighbourhood houses in the United States and in England has become difficult and uncertain. Their activities are varied; but particular attention is given to brightening the lives of boys and girls, to recreation, to civic responsibility, and

to street and other neighbourhood conditions. The impulse has spread to rural areas, and an intensive study of village and isolated homestead life has taken the name of Rural Sociology. A drive to stimulate and to organize responsibility for the general welfare of the populations of large towns and of cities began in the United States and in England during the great war, and has persisted. It has created civic and other community centers. It gives promise of large results where it refrains from too much imposing of plans and rules, and effectively evokes the self-organizing and self-directing power of the citizenry.

In every sovereign state there are would-be states. Every priesthood, every army, every landed aristocracy, every trading and manufacturing middle class, every peasantry and proletariat, has been a would-be state. Blocs of every description, farm blocs, manufacturers and traders blocs, bankers blocs, professional blocs, are incipient or potential would-be states. Every would-be state strives actively to become sovereign. It initiates and foments class struggle. It experiments with insurrection and rebellion. When opportunity offers it goes on to revolution. At other times it falls back upon conspiracy, plotting, agitation, and the tamer political methods. The

visualized end of its activity is a dictatorship, whether this ugly word is frankly used or religiously tabooed. The aim is to organize the state, to institute, define and administer government, to shape policies. It is the would-be state which unceasingly does things *to* the sovereign state. Thus far in history a succession of would-be states has done but little *for* the sovereign state, beyond substituting limited monarchies and republics for despotisms, and constitutional governments for absolute ones.

Spasmodic attack upon prevailing conditions, evil and reprobated, has recurred throughout recorded history. Systematic and organized effort to abate them is a characteristic phenomenon of modern times. It enlists the energies and the financial resources of all the agents and agencies of amelioration: individual, social, societal, and governmental. Rapid and remarkable progress has been made in the development of workable plans and effective methods. Sickness and the morbidity rate are being minimized by sanitation, preventive medicine, and the control of epidemics. Violent death and disabling injury are found to be in large measure preventable by reasonable precaution and insistence upon respon-

sibility. Illiteracy and ignorance are systematically exposed, and are attacked by private agencies and by governments. Deficiency and inadequacy of mind and body, only yesterday looked upon as almost or quite irremediable, are yielding in a measure to advancing knowledge of causes and aggravating conditions, and to scientific treatment. Insanity, once dealt with only by brutal restraint and unspeakable cruelties, is now scientifically studied, compassionately and scientifically treated, and may yet, in many of its forms, be prevented. Delinquency has proved to be more baffling. Vice in its myriad forms has not been much diminished either by direct attack upon degenerative habits or by prohibitions of drugs and alcohol and questionable amusements. Crime has never been more flagrant and defiant than it is now in the United States. "Cruel and unusual" punishments have been done away with, and incarceration has been ameliorated; parole systems have been tried; juvenile delinquency has been studied, and hopeful experiments to minimize it have been followed up; all with little result so far. We await the discovery and adoption of effective means of crime prevention.

Of the systematic drive to diminish unemployment, exploitation, and misery, the

story is more heartening. Charity organization societies, societies for improving the condition of the poor, and other private relief agencies, have accomplished much and have taught us much, but the burden of big effort and expense has been carried by labour organizations and the tax payer. That by foresight, planning, organization, and adjustment to economic cycles, unemployment can greatly be diminished has been demonstrated. Legislation has contributed something toward the minimizing of exploitation, but the sheer power of organized labour has curbed it. An exception must be made in the case of child labour exploitation, which can be stopped only by legislation, and will be. The diminution of economic misery, also, requires the coöperation of private effort with legislation. Insurance and old age pensions have proven their value.

Very recently indeed, the problem of the possible degeneration of an entire population has begun to receive sober attention, and systematic effort to study and to deal with it preventively has made a surprising start. A demand has arisen, and the American Congress has listened to it, that the unrestricted immigration of all sorts and conditions of men shall cease, and that such immigrants as we receive shall be selected as to both stock and

individual character. Miscegenation of white and black has been made unlawful in many states without, however, preventing amalgamation; and notwithstanding fifty years of public and private effort to ameliorate them, the relations of white and coloured races in the United States have never been more perplexing than they are now. The desirability and the possibility of assimilation (always to be distinguished from amalgamation) of the native and foreign born elements of our population came sharply to attention with our participation in the European war. There has been legislation against the teaching of foreign languages in the schools and against a foreign language press, but some of it has been repealed. Religious prejudice, which has a way of flaring up and dying down, has of late been unfortunately strong. The more hopeful efforts are along the lines of a strictly secular education and attention to morale.

Birth control and eugenics are in the controversial stage.

Since the memory of man ran not to the contrary status, created and bulwarked by law, has irritated. It has often provoked rebellion, which, more than once has run into revolution. Violence more than once has

destroyed status. It survives, nevertheless, and perhaps always will, but in modern democracies probably in minor forms. Essentially it consists of legal differences and inequalities.

The conditions of status with which social and societal effort and the programs of would-be states are now normally concerned are those affecting children, women, the married and the divorced, the hired (wage earners), the convicted (misdemeanants and felons), aliens and enfranchised citizens.

Children remain subject to parental authority, and probably will, but that authority has been limited and restrained. The state no longer hesitates to remove the child from parental custody for cruelty or neglect. In America and in Great Britain most of the ancient disabilities of women, in particular of married women, have been done away with. Women can own property and make contracts in their own name and right. They can enter practically all occupations and professions. They can have legal custody of their children, if the court so orders, after divorce, and under various other circumstances. They can vote. The rightful and expedient status of the illegitimate child and of the unmarried mother is yet, however, a matter of controversy.

Civil marriage prevails in Western Europe, throughout the British Empire, and in the United States, but the sacramental conception of marriage is yet held strongly enough by influential groups, and by such powerful organizations as the Catholic and Episcopal Churches, to complicate the question of divorce. Throughout these regions divorce has been made easier, and divorces have multiplied, but the question whether divorce law should be made yet more liberal, or, on the contrary, less so, is highly controversial. In almost every conceivable way the status of the wage-earner has been ameliorated. It is no longer conspiracy to organize and belong to a trade union. Subject to restraints as to violence and interference with third parties, or with the public interest, upon which the courts insist, the hired workman can participate in a strike or a boycott, and can do picket duty. The convicted misdemeanant and the felon have been accorded certain rights, none so fundamental, however, as the right of *habeas corpus*, long ago won. They can, however, more easily appeal than formerly, and, on evidence, have their cases reopened. They are permitted also many privileges. Whether all of these are expedient, is a controversial question.

The alien is subject to deportation for cause, but from the moment that he takes out his first naturalization papers his status for most purposes is that of a citizen. At all times he has rights of property and of contract. Practically he has the same rights of marriage that citizens have.

That the status of the enfranchised citizen of a republic, which, we supposed, was established for all time after the American and French Revolutions, has now become a matter of serious concern, is a suggestion likely to be startling to many readers. It is only necessary, however, to review the legislation of recent years, in America particularly, to discover that a momentous reaction is under way. In countless particulars personal liberty has been curtailed. Prohibitions and censorships of every imaginable description have multiplied. How far the movement will go no one probably is prescient enough to predict; but what the result will be, if it continues, the sociologist who knows his data cannot doubt. In the Middle Ages the status of a majority of all persons was that of villeinage. The villein could do nothing, beyond certain customary things, without his lord's permission. He could not leave his strip of land, and until long after the break-up of the manorial system he

could not so much as leave his parish in search of work without authorization. He could not chose a wife without his lord's approval. He could not buy or sell except in authorized local markets and under stringent rules. At every turn his life was confronted by "Thou shalt not." That the free citizens of a democratic state could ever, voluntarily and deliberately, impose like bondage upon themselves, would once have been unthinkable. But in America we are doing it. It is becoming impossible to engage in business or to conduct it without authority, extending to details; to engage in uncensored recreations, to see uncensored plays or pictures, to read uncensored books, to have children taught uncensored science, to go on the beach in other than "permitted" costumes, or to serve any but "legal" foods and drinks upon our tables. Whether this movement, to which apparently we are committed, is expedient or will work for ill, is a question that need not here be discussed. I am pointing out only the sociological fact that, wisely or unwisely, as the case may be, we are creating for ourselves and imposing upon ourselves, *a status of legal villeinage*.

Personal work in behalf of individuals, families, and neighbourhoods has become profes-

sionalized, a fact which plainly shows how technical as well as how earnest and how detailed this activity now is. The name, "social work," which has been given to this profession is descriptive. The practice of social work comprises encouragement, instruction and counsel, many kinds of first aid in accident, illness, mental difficulty, and economic distress and much exploitation for worthy ends of human resources within immediate reach; but essentially and chiefly it consists in making and breaking social contacts. The assumption from which it starts is that helpful social contacts are not only a broadening of opportunity but also a major and effective influence in reconditioning interests and habits, while consortings with vicious and criminal companions are, all in all, the most evil of known influences upon character and conduct. The social worker systematically makes social contacts for herself or himself not only by taking advantage of introductions and chance acquaintanceships, and of opportunities for first aid or instruction, but also through participation in local interests and activities, including, often, participation in wage earning industry. The successful social worker is by nature considerate, tactful, and resourceful. By training he or she should be grounded in physiology, social psychology, so-

ciology, and economics, and have become competent to give information and counsel and to render all the kinds of first aid that have been named. By sympathy and experience he or she should have become able to understand, to value, and to fit into the circumstances and the folk-ways of the neighbourhood.

Another and more ambitious profession of societal telesis is in view, but hardly yet established. It has been thought and talked about enough to have acquired a name, to wit, societal or human engineering. A world full of nations crippled and exhausted by a devastating war is grim evidence of our need of it. It has been needed, in fact, since civilization arose. Much of what Mr. Spencer said fifty years ago in the first chapter of *The Study of Sociology*, "Our Need of It," can profitably be read now as a statement of our need of societal engineering.

Engineering of any description, civil or military, mechanical, chemical, or electrical, ecological or societal, is an acceptance of scientific principles as the basis of practice, and a following of technical methods of applying them. It is hard and expensive work. Imagination has place in it, but wishful thinking has not. The engineer studies the situation with which he is expected to deal before he meddles with it, and

the feasibility of the thing which it is proposed to do before he begins operations. He acquaints himself with the nature and potentialities of the materials and energies, activities and capabilities, to be worked on and with. With all possible precision he estimates costs, including costs of rights to be acquired, and of liabilities, claims, and damages to be met. Then he determines upon a method to be followed and works out the details of operations and procedures. Finally he reduces the whole undertaking to working plans and specifications.

It is hardly necessary to insist that the engineering way has not been followed extensively in social reform, class struggle, public policy, or legislation.

The present human situation which calls for ameliorative engineering comprises both bad heredity and bad environment with resulting physical and mental inadequacy, accident, illness, exhaustion, fear, ignorance and perversity, inadequate organization of relations, ineffective applications of effort, injustice and exploitation, poverty, misery, hatred, and war.

The feasibility of projects of amelioration receives little enough consideration from untrained and unchastened uplifters, and none whatever from our phosphorescent ignorati of

revolt and revolutionism. The engineer knows that feasibility is limited and is grimly conditioned by human constitutions, nerves, and energies, and by the costs which must be met out of finite incomes.

The engineer who works with physical materials and energies knows that he must bear in mind their properties, the uses to which they are adapted, their limits of resistance, the types of motion, coördinate, turbulent, or radiant, which they exemplify; and, not least important, the spill and waste of energy when it is converted from one mode into another. Human engineering calls for like knowledge, and, above all, for recognition that there are loads which human nerves and muscles can no more carry, and shocks which they can no more endure, than steel girders or concrete arches can withstand unlimited strain. Least of all can they hold out under relentless speeding up. The mechanical engineer knows that something will happen if he runs a grindstone or a soft iron rim as many revolutions a second as he can run a high-grade steel fly wheel; but not a few of our self-constituted advisors in general to mankind are preaching the delusion that backward races and slum populations can be speeded up to any velocity if they are given a few turns in the educational lathe, sand-

papered and washed, and geared to the peoples that have been tempered in fires of adversity and rolled in the mills of destiny for ten thousand years.

It seems almost childish to say in so many words that it is the limitation of human energies which always raises the question of costs and compels us to decide whether we should devote our resources to this cause *or* to that, in the certainty that we can not devote them to this cause *and* to that. But the number of seemingly intelligent persons who are as incapable of seeing this elementary fact of economics, as a colour-blind man is of seeing a red lantern, is legion. They imagine and talk about a "social surplus" which is always growing, and upon which we can draw whatever amounts we need by filling in blank checks that God in His goodness has signed in advance. Driven to explain, they say that a combination of discovery, invention, and organization promises an indefinite increase of production, forgetting that each of these wonder-workers is not a talisman, but is *an expenditure of energy*. Happily there is, or can be, such a thing as surplus, but it is finite, and it is obtained only in the way in which the brothers in the fable obtained the treasure which their father had hidden for them in the garden.

The proximate means which societal engineering can make use of, are identical with those which amateur effort has experimented with. They are: religious (energy releasing), educational, economic, legislative, and governmental activities. Back of them all is an ultimate procedure or fundamental method. This is equilibration, a balancing of resources and energies, processes and forms. It is identical with the method (or process) which we discover in physical and in biological evolution.

Arrived at the fact last named, that the fundamental method of societal engineering is identical with the process of natural evolution, we have come back to the starting point from which our study of societal telesis proceeded; but now with abundant proof obtained that the telic process in human society does not, in any reasonable meaning of the word, supersede the genetic process. It is a projection and conditioning of the genetic process. Not only is the method or process of the one essentially identical with the method and process of the other, but also the causes and effects of the one are identical with the causes and effects of the other. To be more meticulously precise (since the importance of the topic perhaps justifies precision) the telic activity of socially

organized man is an effect of the efficient causes at work in societal genesis, and the visualized ends, or final causes, of the telic process are broadly identical with the inevitable or natural consequences of the genetic process.

A perfect example of the identity of a telic process with the effect of natural societal causation is seen in the evolution of legal villeinage. Society is a product of pressures, physical, biological, and circumstantial. Legal villeinage is a product of purpose—of concerted volition—but back of volition are the circumstantial pressures arising out of increasing population, the modern mobility of population, the heterogeneity of modern peoples, the complexity of the societal order, and the speeding up of life. The villeins of feudal days became villeins by "commending" themselves to their lords in exchange for protection. They surrendered their freedom and sought protection to escape from perils and miseries more unbearable than villeinage. Modern populations have created legal villeinage and imposed it upon themselves in the belief that thereby they find protection against aggressions and disorders created by antisocial and non-socialized elements that are more unbearable than restraints of liberty.

The visualized ends of telic activity in human society and by it are: Amelioration of

the human lot, by security and material abundance; the survival (which security and abundance make possible) of variates from a standardized human type in whom lie our hope of discovery, of invention, and of experimentation; the socialization of entire populations, with elimination of the antisocial; and that individuation which is an evolution of intelligent, responsible, self-determining personality —of adequate man. And these ends, for which we strive, we have perceived and found desirable, because a societal evolution which we did not plan produced us, produced them, and enabled us to see them!

CHAPTER IX

THE VALIDITY OF INFERENCE FROM SOCIETAL EXPERIMENTATION

Any attempt to ameliorate or to improve human life by achieving visualized ends is an experiment. The scientific difference between experiment as it is conducted in a physical or a chemical laboratory, and experiment in, on, or by human society, was explained in Chapter III. When an experiment is completely and correctly controlled no question of the validity of a logical inference from it, or about its results, can be raised. If perfect control is impossible, the validity of every inference from an experiment or about its apparent results must be determined, if such a thing is possible, by accredited scientific procedures.

Is it possible? John Stuart Mill in his *System of Logic*, published in 1843, to all intents and purposes said "No," and argued that a science of society must be deductive in form and method. Finding no sufficient premises other than conscious motives, selfish or benevolent, from which to deduce human behaviour, Mill

saw the possibility of only two social sciences, namely, political economy and ethology, the latter a science of character and conduct. This view of the matter, fatal, if true, to sociology, has given aid and comfort to two generations of economists, and has buttressed an assumption against which sociology has had to contend (to its own great advantage, however,) that political economy, if not the only true science of human interests and affairs, is at least more scientific than sociology is or can be.

As it happened, Mill's answer was wrong, and it is probable that he himself would have seen that it was wrong if by chance he had become well acquainted with the statistical investigations which Jacques Adolf Lambert Quetelet had been publishing in rapid succession since 1830, although the theoretical implications of these were not developed by Quetelet until 1846 when he published his treatise, *Sur la théorie des probabilités appliquées aux sciences morales et politiques*. Quetelet's work obtained recognition slowly, and even now the social sciences are by no means fully awake to its significance. They cling to Mill's unfortunate fallacy. To understand the logic and to use the methods of statistics takes brain work of another kind, rather than of another intensity or amount, from that which is deduc-

tively creative, and education for the statistical way of thinking has made slow progress.

These remarks are possibly by the way. What immediately concerns us now is that the validity of inference from any kind of experimentation, from the roughest trial and error, to experimentation that is almost controlled (as some of our industrial and commercial experimentation is), can be determined. The assumptions and the methods have been worked out and are known.

We have first the irrefutable assumption, long denied by bewildered philosophers, but none the less undeniable, that the validity of an induction differs in no way, qualitatively or quantitatively from the validity of a deduction. The content (or detail) of infinity is unknowable, and, conversely, all that is knowable is finite. Therefore, we cannot say with certainty what may happen one day in a series of happenings which is theoretically infinite. The sun has "risen" many times without missing a date, but we cannot possibly know with *certainty* that it will "rise" tomorrow. Therefore, all that induction can give us is presumption or probability. But, also, *this is all that deduction can give us*. The certainty which deduction seems to give us is hypothetical only. *If* the premise is true and the logic impeccable, the

conclusion is true. And since we can know nothing of the content of infinity, any premise which assumes a content of it is invalid, except for hypothetical purposes. The only premises which we can use in the quest of finite knowledge are empirical facts arrived at inductively.

What, then, is presumption or probability, the sum and substance of concrete finite assurance? It is nothing more nor less than, or in any way different from, a relative frequency of occurrence (a ratio of occurrence to non-occurrence) of something or other within a finite field of occurrences. Or, more briefly, presumption (in distinction from a merely hypothetical certainty) is a ratio.

In everyday discussion we do not observe these philosophical niceties; we have no need to. For practical purposes we say that a possible occurrence which always *does* occur *will* occur *certainly*; and that an occurrence which occurs usually, but not always, is presumptive or probable. Through controlled experimentation we arrive at knowledge of one and another invariable, (or, as we say, certain) occurrence. Through uncontrolled experimentation, and valid inference from it, we can arrive at knowledge of probable occurrence.

We often say that our ultimate proof of the validity of an inference from uncontrolled ex-

perimentation is the survival of something or other, or of somebody or other. But this proof, for which it may be necessary to wait while generations come and go, is after all a presumption. Human society reveres a thousand taboos, commands, and institutions, products of prolonged experimentation, which are held to be useful or even necessary. Yet, every now and then, an idol is broken or scrapped, and no harm follows.

Therefore we need, if we can find it, a way of determining now, and with the highest attainable approximation to certitude, the validity of our inferences from uncontrolled societal experimentation.

There are methods. They are fairly simple; and every scientific student of society should give heed to them, and learn to use them.

The first procedure is to delimit the field within which the societal experimentation in question has been going on or is proceeding. The facts enumerated must all be taken from within this field. The delimitation may be regional, temporal, or categorical. If it can be delimited in all three ways that is best.

For example, let it be desired to know if legal requirements of school attendance do in fact curtail child labour in mills, or mines, or street occupations. The data should be

obtained from within a defined area, for a specified period, and for specified occupations, and they should be as nearly comprehensive as possible.

This precaution having been observed, we can do one or another of four more things and perhaps all of them; the more the better.

First, remembering the significance of skewed distributions of numerical data, we can compare the distributions of the facts we have gathered within the given area as they appear before the introduction of an experimental factor and after it. If there is an unmistakable and considerable increase or decrease of skew, or a considerable change in its form, we have strong presumptive evidence that a new cause has been at work. It remains, however, to ascertain, if we can, whether the new cause can be identified with the experimental factor which we are observing.

In the second place, remembering that all probability is a ratio, we can ask whether our experimental factor is of appreciable or impressive magnitude by comparison with the magnitude of changes attributed to it. The ox is a sturdy beast, but he can't draw a gang plow. If, to return to our example, a school attendance law has lengthened required attendance by only two or three weeks a year it presum-

ably has not cut down the number of mill workers under fourteen years of age by twelve or fifteen percent. A few feeble trade unions could not tie up industry and commerce by a general strike, but a nation-wide organization of wage earners might, and it might be the only cause of sufficient magnitude at a given moment to do so. A third party mustering a few hundred thousand votes could not decide a national election or its issues unless the dominant parties were of almost equal strength, but a third party commanding many millions of votes might dictate terms.

A third thing that we can do to check the validity of an inference drawn from societal experimentation, if we have obtained adequate data is to compare our ratios with the arithmetic of chance. For this purpose we must have an approximately complete listing of occurrences of societal phenomena of a given kind or of given kinds, into which the experimental factor under observation has been intruded, and of occurrences of phenomena of the same kind or kinds from which it has been absent. Then, if in more than fifty percent of all occurrences the experimental factor has been present, there is a reasonable presumption that it has been an effective cause of change, and the probability increases with the percentage. The

probability that one or the other of two alternative possibilities will occur by pure chance is fifty-fifty, as everybody knows. The probability of occurrence of each of a larger number of possibilities is proportional to the number of possible occurrences of each. If you draw twenty cards from a pack and fifteen of them are red, you may reasonably infer that the pack has not been well shuffled. If you discover that three-fourths or more of all states in which child labour is yielding to school attendance have laws restrictive of the one and mandatory of the other, you may reasonably infer that the legislature has in this instance been more potent than the alleged "humane sensibilities of our Christian communities."

Finally, we may measure correlations.[1] This is a precise way of determining degree of coincidence, concurrence, or association of phenomena that can be numerically expressed in arrays of counts or measures. If, in a large number of cases, we find a high correlation of the occurrence frequencies of our experimental factor with the occurrence frequencies of the result attributed to it, the presumption of causal nexus is strong. For example, the inverse occurrence of cases of small pox with occurrence of vaccination is too manifestly revealed and

[1] *Vide infra* Chapter XII.

precisely measured by a high correlation coefficient unmatched by any other within the field of small pox phenomena to leave reasonable doubt that vaccination more than any other cause has diminished the ravages of small pox; and we have like proof that innoculation has brought typhoid fever under control. This proof is not as dramatic, but it is as substantial, as the experimental proof that certain mosquitoes are the carriers of malaria and of yellow fever.

The statistician must, it is true, watch his steps when reasoning from correlation. There is always the possibility that a given correlation is a mere arithmetical accident. If it is not in this sense "spurious" a correlation may point to a common cause of the phenomena exhibited in the arrays of frequencies. Or, a third possibility, two correlated arrays may truly indicate, the one, cause, the other, effect, without revealing which is which. If, however, we can measure a multiplicity of correlations we can assign relative effectiveness to each of a considerable number of coöperating factors. The logical points to be remembered are, one, that the highest correlation points to the major causal nexus; and two, that if in a given combination of factors one factor, assumed to be a cause, and another factor,

assumed to be an effect, persist in correlation while other factors and correlations come and go, the persisting factors are beyond doubt major cause and major effect, the other factors being only conditioning influences. These points are the essentials of the logic of concomitant variation, stated more precisely than Mill stated it.

It is by the application of these procedures to relevant and adequate data that we may hope in time to build up a scientific criticism of the enormous mass of loose inferences which we now encounter relative to the consequences of countless societal experiments which, in modern democracies, are being made in every realm of human effort.

CHAPTER X

EXPLORATION AND SURVEY

A scientific scrutiny of facts and a scientific interpretation of relations are not complete until we have asked the question, as old as human apprehension and desire, as old as curiosity, What else? What else is, or happens? What else was, or happened? What else will be, or will happen?

Yet so indolent are we, and so swayed by wishful thinking, that we do not always conscientiously ask these questions when seeking knowledge or attempting to achieve visualized ends. In societal telesis there has been incalculable waste of effort and of resources through failure to ask one of these questions in particular, namely, What else probably will happen when we bring about, or try to bring about, a change that we have in view, and believe to be desirable? This neglect is the characteristic vice of legislation.

Exploration and survey are systematic methods of trying to discover "what else."

The primary meaning of the verb "to explore" (*ex* and *ploro*) is to call out or to cry out

into uncertainty, not to a person in view or for help in sight. It connotes the missing, the unseen, the possible; and probably from the earliest days first attempts toward systematic exploration have consisted in random questionings and observations. Questionings have been addressed to travelers returned from distant parts, and to other persons who have had unusual opportunities or experiences. Observations have been made by the way in the course of wanderings "to find out." Then have come reconnaissances. Invaders have sent resourceful scouts "to spy out the land."

Out of these beginnings have been developed explorations which are orderly to a degree. The mining engineer improves upon the ways of the prospector by running drifts, in one and another direction, through ore-bearing strata, to discover veins and pockets rich enough to pay for working. The archeologist sinks shafts and trenches to the bottom of successive accumulations of human handiwork, ages ago abandoned. The social and societal explorer, after visiting, touring, slumming, and interviewing, resorts to questionnaires and films which can be checked up.

Exploration at its best is a careful sampling of a field, regional, temporal, dynamic, or what you will. The survey is a larger undertaking.

It is a comprehensive examination of a field, a combination and total of explorations. It comprises observations, enumerations, measurements, and precise determinations of metes and bounds.

Surveys are of two fundamental types. One is the pattern survey, the other is the variability survey. The pattern survey maps and graphs form and action patterns, as they appear at a given moment. The variability survey records changes in form and action patterns from time to time occurring, and, also, should if possible record changes in rates and ratios of change. The variability survey presupposes pattern surveys, repeated at constant intervals.

A pattern survey, if adequate and accurate, may have large value because of its disclosures of unsuspected resources, opportunities, and relationships, and, as well, of unsuspected dangers, liabilities, wrongs, and other things objectionable. When these matters have been established and have become familiar knowledge the question of the worth-whileness of repeating the survey occasionally, or regularly at intervals of equal length, turns upon the value of a variability survey, and this involves questions of cost.

These considerations are of prime importance as they bear upon social and societal

surveys, to which now we may turn attention.

Social and societal surveying has been a fad and an industry. It is becoming a scientific enterprise, of improving quality. It is beginning to give us trustworthy and significant information.

The best surveys of human interests hitherto have been of limited scope. They have been specifically religious, educational, commercial, or industrial, or specifically surveys of living conditions, working conditions, family incomes and family budgets. Comprehensive surveys of entire communities have not been numerous, and with such outstanding exceptions as Charles Booth's *Life and Labour of the People of London*, in England, and the Pittsburgh and Springfield surveys in America, have not been notoriously excellent.

It is now and then in courtesy, but usually it is in ignorance, that such surveys as have been made are described as "social," "societal," or "community" surveys. The sociological data and suggestions which they offer us are meagre. The religious surveys are ninety percent or more religious. The educational surveys are ninety-five percent technically educational. The trade and industrial surveys are ninety-nine percent technically economic.

Even the surveys of living conditions, working conditions, family incomes and family budgets, which would be better worth-while if, without being less economic, they were more sociological, have so far contributed little to social or societal psychology, to our knowledge of folk-ways, or of cultural conflicts, or to our understanding of the variability of leadership, of organization, or of status.

A survey that could properly be described as social and societal would discover, record, map, and graph phenomena that are social or societal in a strict instead of in a loose meaning of the words. It would ascertain and disclose prevailing, unusual, and peculiar stimulations and responses, exhibited in multi-individual behaviour; habits of association and of co-activity, especially the variate forms; common excitements and uncommon outbreaks, and their causes; persisting folk-ways, changing ones, and new ones; controversies and deliberations; cultural conflicts; group and class struggles; variate forms of leadership and of organization; social work and societal engineering; status and its variability; the variability of coercion, including intimidation and bullying; the variability of liberty, and the clash of liberty with coercion; the variability of such ameliorations of life as security and abundance;

the variability of viable departures from type; the variability of socialization, as shown by the kinds and amounts of prevailing vice and crime; and the variability of individuation, and of adequacy.

A true social and societal survey, comprising these essentials, is as yet a possibility only. I have never yet seen one, and I have never yet been able to persuade a student of sociology to undertake one.

And, as might be expected, I do not know of any comprehensive sociological survey of a community. The best approximation to one that I am acquainted with is Professor James M. Williams' study, *An American Town*. Such a survey would comprise all of the foregoing matters, and by way of background, a detailed and trustworthy account of the origins and historical evolution of the community; of the peculiarities of the inhabitants, generation by generation; of the regional influences and circumstantial pressures that have borne upon them, selecting and conditioning them; of the resulting heterogeneity or homogeneity of physical and of mental type, and the consequent mental and moral levels.

A community survey may take for its field a village, a town, a city, a county, a state, a region or section, or a nation. It will be long

before we shall have detailed community surveys of wide extent. We could have village surveys made by individuals or private organizations, and it is to be hoped that the rural sociologists will undertake them. State and national surveys must be public enterprises. The United States Census, with all its shortcomings and imperfections, is the most important undertaking by way of general societal survey that has yet been attempted.

CHAPTER XI

THE MEASUREMENT OF SOCIETAL ENERGIES AND TRENDS

A true and complete description of anything must include measurements of it. Even identification of it may turn on dimensions. A memorandum on a police blotter would hardly identify a suspect if it recorded only such qualitative facts as colour of eyes and hair, omitting to mention height or weight, not to speak of lesser items of the Bertillon scheme.

There has been a good deal of unprecise talk among sociologists and social workers about "social forces." For quacks and amateurs the phrase is charged with mana. It creates an illusion of knowledge at command which suspends intellectual animation, and may end in mental coma. To scientific inquirers able to keep their heads it offers possibilities not yet exploited.

Social energies there are; obvious in manifestation or detected by accident, subtle in working or terrific in explosion, and so far known; but they are not yet brought within scientific

description, certainly not within the quantitative formulation characteristic of our familiar descriptions of thermo-dynamic, chemical, and electro-magnetic energies. Therefore, they are not always correctly identified and classified. Not all of them in strict parlance are "forces," namely, coördinate motions. Most of them are turbulences, like chemical energies and heat.[1]

The lists of social energies that we now and then encounter in books, are impressive for other reasons than scientific value. To cite an item that recurs in more than one of them, many list-makers following Ward, name appetites and desires among primordial social energies. So they are, if all one means is that they are relatively elemental factors of social situations and happenings; but so also, in this sense, are gravitation and the precession of the equinoxes; and neither the one pair of energies nor the other offers us a hint as to the nature of society, its origin, or what it is likely to do next. The sociologist, casting about for a working hypothesis, would be in better luck if his intuition turned to—well, let us say, the group-assembling power of eclipses or of medicinal springs.

[1] *Vide ante* pp. 6, 7 and *cf.* Giddings, *Studies in the Theory of Human Society*, pp. 135.

In measuring anything, tangible or intangible, it is necessary to remember that the measuring process begins with counting items or units, and that all subsequent procedures are statistical operations. Measuring instruments are either (1) devices for precise delimitation of the units to be counted, or (2) devices for counting many units at once, as when we count twelve inches at a time by means of a foot rule or sixteen ounces at a time by means of a pound weight, or (3) devices for giving us ratios, the slide rule for example.

In measuring energies it is necessary to remember that it is impossible to measure them directly. We can measure them only in terms of what they do. For example, the kinetic energy of water falling from a height through a turbine; of an uncoiling spring; of superheated steam back of a piston head; of an electric current; is measured by the number of pounds it can lift one foot in one second, or by any equivalent "work." The intellectual or moral energy of a man is measurable to the extent, and only to the extent, that he "does things" which can be described in terms of units of accomplishment.

Furthermore, "work," "accomplishment," "something done," is always resolvable into

one or the other of two concrete things, or into a combination of the two. These two things are: (1) a modification or a transformation of a condition or of conditions, as for example, the draining of a bog, the repairing of a house, the washing of a boy's face; (2) "starting something," "keeping something going," stimulating behaviour and maintaining it, in short, "carrying on." To the extent, and only to the extent, that these concretes can be resolved into units that can be discriminated, identified, delimited and counted, "work" can be measured.

Finally, measurements can be "checked up" in various ways. Three of them are important, and where all can be used, the measurement is approximately verifiable.

The first way is given us in the fact that all energies known to man, whether they are of the group that we call physical, or of the group that we call moral, are identified with concrete material bodies which store and carry them; and their possibilities of manifestation in kinetic energy, capable of doing work, are roughly proportional to such facts as the size, weight, number, composition, known qualities, and position, of the carriers. If, therefore, a smoking-car acquaintance tells you that half a ton of coal, thrown into the fire-box of a ninety

ton locomotive, once pulled one hundred flat cars, loaded with pig iron up a twenty percent grade for fifty miles, you know that he is a moron, an ignoramus, or a child of Adam in whom original sin has not been impaired by age. Or if, to take an instance from the human field, a pan-racial egalitarian tells you that Bushmen, Hottentots, Congo Pigmies and Philippine negritos, brought together in regiments and armed with javelins could go through a Verdun, Chantilly, or Belleau Wood battle front, you have a similar "line" on him. Or, even if, to take one instance from politics, an assertive mind with democratic convictions tells you that the moron half of the American population is capable of electing Congressmen who, in their turn, are capable of knowing "what all the shooting is for" when a tariff bill or a League of Nations resolution is under debate, you can place *him* in one or another of the above named three categories, according to taste. In short, the identification of energies with concrete complexes of fact enables us to perceive immediately the limits within which our measurements certainly must lie and to know that if we have obtained a result which jumps over them we have made somewhere a serious error. It would seem that anything more obvious than this truth would be hard

to discover, and yet alleged physical measurements in contempt of it, speculative values that jeer at it, and prosperity or calamity predictions that blaspheme it, are daily fed to a voracious public.

The second way of checking up is given us in the fact that every manifestation of energy is associated with other manifestations, every condition with other conditions, every known mode of behaviour with other modes. Three examples will suffice for my present purpose.

One: there is an association, which sometimes is a low, and sometimes is a high correlation, between an artificial transformation of conditions and *money cost*; and conditions affected by money outlay, if repeated or duplicated, have an average cost. Wide departure of any other measure of artificial transformation from this average, or usual, cost is a caution signal.

Two: there is an association which may be a low or a high correlation, between money *expenditure* and a transformation of conditions. For example, per capita expenditure for schools provides more education in one place than in another, and at one time than at another, but there are prevailing average relations between expenditure and such facts as number of school houses, number of school days in the year, and

average attendance; and these averages must be kept in sight when making measurements of educational conditions.

Three: there is a correlation between the modifiability (and therefore the improvability) of human behaviour and the organic mechanisms which we call brains. That instincts can be "reconditioned" (detached from old stimuli and made to react to new ones) we know; that habits can be taught and acquired, we know; that morale can be improved, army discipline has demonstrated. But, also, we know (or we can know if we will take the trouble to find out about it) that not all physiological and not all psychological elements, and not all the various ethnical complexes of physiological and psychological factors that compose a population are equally teachable. Measurements of social betterments that do not check up with these facts should be held under suspicion.

The third way of checking up consists in having all observations of fact (i. e. all identifications and delimitations of the units to be counted) made by more than one observer and at different times; in like manner, to have all countings, distributions, totalings and analyzings of countings, made by more than one individual; and finally, to carry out the usual statistical procedures of comparing the indi-

vidual results, and obtaining the probable error. Happily, it can now be said that before long sociologists and social workers will be no more able than civil or electrical engineers, biologists or psychologists to hold responsible positions if they are ignorant of statistical logic and methods.

The mechanical equivalent of molecular, atomic, or electronic energy (for example, the mechanical equivalent of heat, or of electricity) is determinable with accuracy and is used in obtaining theoretical work-values, which, however, are not true measures of our resources of unexpended energy available for work. Resources are energies stored and carried in material bodies, and these are not homegeneous. Two apparently equivalent lots of wood, or coal, or oil, turn out to be not strictly equivalent in combustion. Therefore, our measures of resources (which often are the measures that we most need) are estimates only. They are derived from statistical frequencies, trends, and averages, and their value (i. e. their approximation to accurate measures) depends on the extent and representativeness of the data available.

How much work should a ton of coal of a given quality do? How many cubic feet of earth should ten men throw into a cart in an

hour? How many families, dwelling two or three miles apart in a rural county, should a visiting nurse be able to look after sufficiently to insure each against any real neglect, to instruct mothers and children in essentials of health-protection, and attend to usual emergencies? What may reasonably be expected of a school superintendent in an agricultural county? What may reasonably be expected of an agricultural experiment station of a stated endowment and income? These questions, and thousands like them, are answerable only in terms of averages, obtained in each instance, from a large number of representative cases.

Let us now return to social and societal energies, and examine more particularly their characteristics, and the problem of their measurableness.

And first, what are they? The first step toward exact knowledge of anything is to define it, by discriminating it (from other things) and delimiting it.

The term "social forces," as I have intimated, is loosely used; in fact, so loosely that it has acquired at least three different meanings. (1) There are energies that do not originate in society but which often produce social and societal results. Conditions and circumstances, including hardships and dangers, that drive

men into consorting and coöperation are in this sense social and societal energies. It would be better to call energies that produce social and societal results "socializing energies," whether they originate outside of society or within it. (2) Tremendous energies that originate in society produce results that may or may not be social in quality. Riots and lynchings, for example, are not. It would be well to call these energies "societal," regardless of the quality of what they do. (3) Then we should have, as the intelligible and accepted definition of societal-social energies all energies that both originate in society and produce social and societal results: the socializing energies that are societal, and the societal energies that are socializing.

What, then, is a social and societal result?

Any thing, or quality inherent in association and inseparable from society is "social" and "societal." Society is any considerable number of human beings living and working together, and more or less enjoying themselves with one another; and a lot of ways, more or less organized into arrangements, and more or less made orderly by precedents and rules, in which we, human beings, carry on and help one another to make life secure and desirable. It is a product of association, and association

is a by-product of the collective, multi-individual or pluralistic, mode of the struggle for existence. Collective struggle, by comparison with struggle by solitary units, multiplies the chances of life. Society further multiplies chances, and makes life increasingly desirable, by deliberated policies and procedures, and reactions consequent upon them.[2]

These policies and procedures assert, attempt, and largely achieve control. They are comprehensive, but in particular they undertake to determine, regulate, or otherwise govern, the following matters: defense and aggression; resources and opportunities; migrations, and the composition of populations; language, religion, education and morale; conditions and conduct affecting health and physical integrity; employment; income; social organization, from the family to the state, from master and servant to corporation and labour union, from bloc to political party. These controls affect each successive generation for the term of its natural life. Policies and procedures themselves, and their content of knowledge, are handed on from generation to generation in tradition and by systematic teaching, but not in biological heredity. Habits and knowledge have to be built up from their

[2] *Vide* Chapter VIII.

elements, as individual acquisitions, by each new-born child.

The reactions consequent upon control are: (1) A type-making constraint, which supplements natural selection, (a) by killing off kindreds that are composed of individuals or groups which are too quarrelsome, intolerant and unscrupulous for societal cohesion; a killing off which gives a survival chance to whatever germ-plasm bears and hands on sympathetic and scrupulous impulses;(b) by killing off kindreds, and in the long run races, that are incapable of acquiring and using knowledge, *or of being used* (and, therefore, bred and protected, as cattle are) by knowledge-using stocks. (2) Explosions of self-determination assertative of liberty, and of ethical impulses repressive of exploitation. Large-scale exploitation undoes past achievement by giving a reproductive advantage to exploited stupidity. Therefore, the emotional and dogmatic explosions that repress it have a fortunate consequence, not always foreseen by the participant crusaders but vital to civilization. (3) A struggle between natural superiors and natural inferiors, taking form in class warfare, in rules and laws in restraint of ability, in egalitarian experiments, and in revolution and counter-revolution. A normal outcome (in the

long run) is the elimination of kindreds, classes, and societies in which inferiors have exterminated or by fecundity have submerged superiors, and have become ascendant.

In society (understanding by the word all the particulars that it denotes, including ways and arrangements of associative life, policies and procedures, reactions, products, and wastes) are comprised all the results effected by societal energies. They are the work, the whole work, and nothing but the work, that societal energies do. Therefore, they are the measures, and the only possible measures of societal energies.

But is this work, then, itself measurable, in a strict meaning of the word: is it measurable in terms of units that can be delimited and counted?

We need not waste energy in arguing that society in its unanalyzed integrity is not; that its ways and arrangements are not; that its policies and procedures are not; and that such general reactions as tradition and opinion, faith and enlightenment, utilities and values, cohesion and liberty, conflict and survival, are not. What remains?

There are further products—proximate and ulterior—of societal turmoil and evolution, which, in a statistical sense of the word, are

tangible, and these, happily for sociology, are measurable. Although they are obviously only a part of the work that societal energies do, and measures of them therefore are obviously not truly measures of the societal energies at work (which, it now appears, are not really measurable at all) these products of social evolution *are* measures of the *effectiveness* of societal energies, and are of scientific value.

Societal energies directed by knowledge, and discharging themselves through the mechanism of societal organization, have increased the per capita food supply of the human race and diminished the chances of death by starvation. They have made it possible to diminish the annual number, per million individuals, of deaths and disabling injuries by accident and violence. The possibility would become reality if our population contained more men and women of B and A intelligence (i. e. *conditioned* intelligence) and fewer morons.[3] Per million deaths and disabilities from endemic and epidemic diseases have been diminished. The ratio of safe, sanitary and decent housing to population has been increased. Income earning opportunity per capita has been increased. In civilized lands education has been provided

[3] Intelligence tests to date have been imperfect in that they have not separated intelligence *as born* from intelligence *as conditioned* by habit and crisis.

for nearly all who have the will to avail themselves of it.

These concrete products of societal energies are outstanding by reason of their importance. There are many others that need not be named. All are measurable statistically in various ways, but most conveniently and perhaps most accurately by the approximation to zero of the number of disabilities and deaths from such specific causes as famine, accident and disease, and by the approximation to zero likewise, of the number of unsafe, unwholesome and indecent dwellings, individuals unemployed, and illiterates.

These measures are representative of conditions, or factors, which are necessary for the emergence of an ulterior product of societal evolution, namely, an adequate mankind. Human society is not an end in itself, it is only a means. The normal outcome of societal dynamism and functioning is the conservation and development of men and women adequate to carry on a relatively desirable life, to make it yet more desirable, and to hand it on, so bettered, to posterity.

In what then does adequacy consist? Answers to this question a generation ago were more or less wrong. Our later biology, and a psychology that is rooted in biology, have

given us an answer that we can rely on, and can build our statesmanship upon if we have sense enough to do it.

Every human being comes into the world with prepotencies that are inborn (inherited) but which can be conditioned by education and discipline and so made to function within a wide range of possibility and efficiency. Society does the conditioning, but it can affect prepotency only by selection, that is, by killing off certain heredities and conserving others. Adequate men and women, therefore, are men and women who, by inheritance, are anatomically normal, physiologically sound, and mentally able; who by education are informed and enlightened, by discipline are made self-controlled, and by training are made effective; and who, finally, are fecund, reproducing their race, transmitting their hereditary qualities to a posterity which, so equipped with ability, will conserve and increase knowledge, improve education, perfect discipline, and increase the desirableness of life.

Provided with this description and conception of adequacy, we perceive that human beings are not equal as individuals (as mentalized organisms) and that they never can be, however democratic our laws and institutions may become. Every population is seen to be

made up of grades, or strata. Roughly, these correspond to distinctions made in popular speech. There are natural superiors (i. e. superiors made so by nature and habit and other conditioning and not by law) natural mediocres, and natural inferiors. Natural superiors have conditioned intelligence above C (on the marking scale of the now-familiar intelligence tests) and they have no hereditary defect. Natural mediocres have a conditioned intelligence of C and no hereditary defect. Natural inferiors have a conditioned intelligence below C, or they have other hereditary defect.[4]

If with these qualities we combine fecundity, as for sociological purposes we must, we get five grades, namely: A. Natural superiors who maintain a high birth rate, thereby transmitting their high qualities to posterity. B. Natural superiors whose birth rate is low; they serve their generation, and their thoughts and achievements may serve posterity, but their qualities die with them. C. Natural mediocres; their birth rate may be high or low; whatever posterity they have will be mediocre. D. Infecund natural inferiors; they are harmful while they live, but they do not transmit harm-

[4] The word "natural" is used in this paragraph and beyond with a meaning broader than "native," or hereditary.

ful qualities to posterity. E. Natural inferiors who maintain a high birth rate; the men and women of this grade are wholly harmful; collectively they are a vast anti-social power.

All accumulations and controls of societal energy are generated in grades A and B. They carry the entire load of constructive societal work.[5] All progress is their achievement. And it is probably true, as tests of more than one sort have indicated, that not more than four and one-half percent of our total population (described as grade A) is capable of discovery or creative activity, and that not more than fifteen percent (grade A plus grade B) is capable of leadership.

It is the new statistical material provided by the intelligence tests (not only the army tests but also the tests which are everywhere being made in schools and in industries and which, on the whole, are remarkably confirming the results of the army tests) which enable us now by combining them with older statistical materials to arrive at a general measure of adequacy; a measure which enables sociology at last to advance with sure steps upon the scientific road of quantitative prevision. The measure is simple and will readily be understood by the reader who has carefully followed the fore-

[5] Not of supervised toil.

going observations. Adequacy, and therefore the ultimate effectiveness of societal energies, is measured by two sets of correlations, namely: (1) the negative correlation of birth rate and the positive correlation of death rate with hereditary defect, (2) the positive correlation of birth rate and the negative correlation of death rate with conditioned intelligence.

These correlations measure the net value of human society; the net value of the existing, or of any possible societal order. They are a *value* measure of progress.[6]

They should be ascertained, not only for entire populations, but also for component and constituent groups, because the shifting of these, when so measured, will indicate the trend of our civilization. They should be ascertained for colour races, for the native and the foreign born, for nationalities, for local communities, for kindreds and families, for the adherents of religions and sects, for the alumni of colleges and universities, and for occupations.

[6] In distinction from a distance measure, *Vide, ante*, p. 138.

CHAPTER XII

METHODS OF MEASUREMENT

It is as necessary that the scientific student of human society should know the essentials of statistical theory and method as that he should know the essentials of biology, psychology, and anthropology. If he has not had the good fortune to be well instructed in them by competent teachers he must dig them out by himself, from the text books and manuals. If he is made of the right stuff he can do this, and will. To bar possible misapprehension I warn him that he cannot obtain the requisite knowledge from these pages. The purpose of this chapter is to say only enough about methods of statistical measurement that are available in sociology to advise the reader what they are and what can be done with them.

When we factorize phenomena we resolve them into items of two categories, namely, items of sort or kind and items of size.

In Chapter III attention was called to the relativity of units and integers. While any

unit whatsoever is known or may be conceived to be a sum of lesser units, any aggregate of units may be viewed as an integer and taken as the unit of a larger aggregate.

When taken as an integer any unit or aggregate is for scientific purposes an Item. If it can be expressed or represented by a number it is an item for statistical purposes.

Items of one given *kind* are for scientific purposes a Sort. The painstaking discrimination of items by kind or by quality, and the standardizing of sorts by qualitative tests, are the beginnings of scientific knowledge.

An item of sort is crude—or general—if it expresses only a broad discrimination of quality or of kind which might be made narrower for working purposes. An item of sort is refined—or specific—if it expresses the closest shading of quality or the narrowest discrimination of kind that can be made for working purposes. "A cigar" is a relatively crude item of sort. "A colorado claro perfecto Habana" is a relatively refined item of sort.

Items of one given *magnitude* are for scientific purposes a Size. An item of size numerically expressed or represented is a Measure. The painstaking determination of magnitudes by resolving items of size into lesser units, and the standardizing of sizes by the use of stan-

dardized counting devices, namely conventional weights and measures, and measuring and weighing instruments of precision, are the beginnings of *quantitative* scientific knowledge.

An item of size is coarse if it might be resolved for working purposes into smaller magnitudes; it is precise it if could not be resolved into smaller magnitudes for working purposes. A kilogram is a relatively coarse, a milligram a relatively precise item of size.

Any total of enumerated items is a Count. A count may or may not include more than one sort, more than one size. A count is a numerical item.

A sum, Σ, of numerical items divided by the number of items, is the Mean of the items—the arithmetical average of common speech.

Numerical items arranged in order of magnitude, from smallest to largest, or from largest to smallest, is an Array.

Each item of an array occupies a position. Between the positions held by any two items are the infinitely numerous positions that might be held by fractional values.

Counting from the initial or smallest item toward the final or largest item the half way or middle position is called the median position, or simply the Median. If the number of

items is odd there is a median item. If the number of items is even the value at the median position is fractional.

The position half way from the initial position to the median is the first or lower Quartile position. The position half way from the median to the final position is the second or upper quartile position.

Positions one tenth, two tenths, three tenths, and so on, of the distance from the initial to the final position are Deciles.

Positions one one hundredth, two one hundredths, three one hundredths, and so on, of the distance from the initial to the final position are Percentiles.

The sort that most often occurs in a count is the typical sort. Briefly it is the Type. The size that most often occurs is the modal size. Briefly it is the Mode.

If the numerical items of an array be plotted as vertical lines (ordinates) rising from a horizontal base line, a continuous line which touches all tops may ascend steeply as a convex curve, then flatten out into a relatively long and slightly rising concave curve, which, still concave, finally rises steeply. An array which gives this ogive curve, so called, is symmetrical or nearly so. It indicates that the numerical items which constitute it are

the work of chance. An array which gives an unsymmetrical or "skewed" graph indicates the influence of a bias or cause.[1]

The number of items of a given sort or a given size found under given circumstances, is the Frequency of that sort or of that size under those circumstances.

When frequencies are plotted by vertical lines (ordinates) erected from successive positions on a horizontal line (abscissa) representing measures (sizes) the maximum ordinate stands at the mode.

An orderly succession of frequencies from the frequency of the smallest measure to the frequency of the largest one (or from the frequency of the largest to the frequency of the smallest) in a lot of measures, is a Frequency Distribution.

If the greatest frequency occurs at the middle point of an orderly succession of frequencies, and the smallest frequencies occur at the extremes the distribution is symmetrical, and the mean, the median, and the mode of the numerical items comprised in the total distribution, coincide and are identical. If all

[1] Inasmuch as the difference between the smallest item of an array and the median item is necessarily equal, if the array is symmetrical, to one half the difference between the largest item and the smallest one, the ratio of the one difference to the other, if the array is unsymmetrical, is obviously a measure of the skewness.

frequencies are plotted as ordinates a continuous line touching all tops is a bell-shaped curve. Distribution of this type is known as a Normal Frequency Distribution. It indicates the work of chance. An unsymmetrical distribution is called a Skew. It indicates the influence of a bias or cause.[2]

If from the mean of a lot of measures of the same thing any one measure be subtracted, the difference, minus or plus, is a Deviation. The mean of a number of deviations (taking all as positive) is an Average Deviation. It measures the consistency or homogeneity of the measures which have been averaged.

If deviations be squared, the square root of the mean of the squares is the Standard Deviation. Briefly it is called "sigma" and is written σ. It is a more exact measure of consistency than average deviation is. The ratio of standard deviation to mean $\frac{(\sigma \times 100)}{\text{mean}}$ is the Coefficient of Variation. It enables us to compare the variability of one lot of measures with the variability of another lot.

[2] The Pearsonian measure of skewness is

$$\text{Skewness} = \frac{\text{mean} - \text{mode}}{\sigma}$$

If exactness is not required the more easily calculated

$$\text{Skewness} = \frac{3\ \text{mean} - \text{median}}{\sigma}$$ suffices.

Measures of the same thing (distance, weight, stress, or what you will) that differ one from another and deviate from their mean may all be erroneous. If one of them is true we do not know which one it is. If two or more lots of measures of the same thing be obtained, the means (averages) of the lots are likely to differ and to deviate from *their* mean. Any mean therefore, like any other measure, may be erroneous.

From the mathematics of probability it is ascertained that if the deviation of a mean from the average of means to which it is related be multiplied by 0.6745[3] the product stands in a significant relation to chance. A deviation is as likely to exceed this product as to fall below it; to fall below it as to exceed it. For this reason the product described is commonly called the Probable Error.

But the foregoing proposition does not hold true if the frequency distribution is a skew. Therefore it has been contended by competent statisticians that since it is further ascertained from the mathematics of probability that accuracy is constantly related to the square root of the number of measures used it would be well to take, as the probable error of an arith-

[3] The fraction 0.6745 of σ usually is equal to the median of deviations (Median Deviation) from the median of the array.

metic average or mean, the standard deviation divided by the square root of the number of measures used.[4]

Analysis of normal frequency distribution demonstrates that a difference between two means of three times the probable error is unlikely to happen by chance. It indicates bad work, bias, or other factor to be scrutinized.

The statistical analysis of counts into sorts and sizes, frequencies and arrays; the measurement of tendency from or toward zero, and from or toward equality; the measurement of central tendency and of movement from and toward points or axes of reference; and the discovery of relations of contingency, correlation and coördination; these are the major quantitative operations and achievements of scientific inquiry. The terms here used will be defined in due course.

Observations of magnitude include (1) determinations of more and less, which stop short of an actual count of units to ascertain how much more or less; (2) countings of units of unknown size, which may be called secondary units since they have not been resolved into units of known equality, namely primary units; (3) actual countings of equal units.

[4] *Vide* Elderton, *Primer of Statistics*, p. 78.

There are many facts which we know in terms of more and less, but not in arithmetically exact terms. No actual count of units has been made.

For example, we know that an adult is older than a child, although we may not know how much older. We know that a motor car can travel faster than a horse, although we may be unable to say how much faster. We know that Venice had more trade immediately after the crusades than London had, although we do not know how much more.

These differences of more and less which have not been reduced to arithmetical exactness are often of great importance in societal causation. The familiar example is that of a popular plurality or majority in a democratically governed state. As far as governmental policy is concerned, the exact majority or plurality of votes cast in the election is of practically no consequence. The important fact is that one party had more votes than the other. This familiar example is representative of a large class of more and less facts, continually determining the course of societal evolution, and the investigator of society should learn all that he can about them.

These arithmetically inexact more and less classes are quantitative in an algebraic sense. Their sign is plus or minus. We therefore may

say that there is an important statistical field in which our records are algebraic signs rather than arithmetical figures.

The usual, and on the whole the most precise way, of making these records is to put the whole whose parts we are investigating equal to one hundred, and then to mark off the parts as quarters or percentages. Quarters are then translated into the terms of ordinary speech by designating any part exceeding seventy-five percent of the whole as a large majority; any part exceeding fifty percent, but not exceeding seventy-five percent, as a small majority; any part less than fifty but exceeding twenty-five percent, as a large minority; and any part less than twenty-five percent as a small minority.[5]

Observations of more and less are *perceptions*, if the phenomena under investigation are within the field of sight and hearing. We directly *perceive* the quantitative difference between a tall man and a short one, between a slowly moving object and one moving rapidly. In social and societal investigations, however, the entire field of phenomena is rarely within range of the vision or of the hearing of any one observer. In this case any records of more or less that we may make are likely to be records, not

[5] Giddings, "Exact Methods in Sociology," *Popular Science Monthly*, Vol. LVI, No. 2, December 1899.

of direct perceptions, but rather of judgments, which, in their turn, are inductive inferences from perceived facts. There is here a large possibility of error.

Errors of judgment so arising can be eliminated only by subdividing the whole subject or phenomenon under investigation into parts that can be *perceived*, and thereby *substituting an aggregate of perceptions of parts for a judgment upon an undivided whole.*

For example, let there be a belief that the Catholics in a given town attend church in relatively larger numbers than the Protestants do. This popular belief is merely a judgment, if no actual count has been made. It may be erroneous. Without making an actual count, its truth or error may be established. The town in question being subdivided into streets, let the investigator station himself in the different streets one after another, and carefully observe whether on Sundays and other church days, within the actual field of his vision, where perception takes the place of judgment, more Catholics or more Protestants are seen to enter their respective places of worship, no actual count, however, being attempted. Obviously within this limited field of perception a reasonably careful man may be certain as to the facts of more and less. When the entire community

has thus been gone over, an aggregate of definite perceptions of parts will have been substituted for a vague judgment upon the whole. These aggregates must then, of course, be compared with the ratio of Catholics to Protestants in the total population of the community.

This method has long been followed in all the concrete sciences. The astronomer finds the solar system as a whole too large for observation by immediate perception. Instead, therefore, of being satisfied with a judgment upon the system as a whole, he turns his telescope upon each of the component planets; and his final knowledge of the system consists of an aggregate of perceptive observations of the parts of the system, with which his judgment upon the system as a whole is from time to time compared and made to harmonize. In this manner, the biologist, instead of being satisfied with his observation of any animal, or even of any organ or tissue, as a whole, subdivides it into more and more minute parts, upon each of which he turns his microscope; and his resulting knowledge of the whole is an aggregate of perceptions, and of judgments made to harmonize with them.

Our rule, then, for dealing with quantitative phenomena by the algebraic, as distinguished from the arithmetical, method is this: *For*

every judgment on an undivided whole must be substituted perceptive observations upon the whole, subdivided into parts; and the parts must be sufficiently small for this purpose. Judgments of the undivided whole must then be compared with the aggregate of observations.

When this rule has been followed, records of more and less, mere algebraic determinations though they are, should be as certain, although they are not as exact, as arithmetical statistics.

In fact, this rule is only another form of the final test of truth in all the inductive sciences; which is, *the ultimate agreement or harmony of perceptions with reasoned conclusions.* If care is taken to secure this agreement in all those studies of more and less which must necessarily be algebraic, rather than arithmetical, in form, our results will be certain.

Units of unknown size are a particular category of "more or less" quantities. They may be written $a+x$ or they may be written bx.

They occur in the so-called "numbers of position," or ordinals, namely, first, second, third, and so on. These are not measures from zero, or amounts, since we do not know how large, or far from zero, first is. If, however, we know that third is as distant from second as second is from first, we can convert numbers

of position into algebraic expressions of amount by assuming a = the unknown distance of first from zero and writing them a +x, a +2x, a +3x ....., a +nx.[6]

When the interval or "step" from one position to another is known to be unvarying, although we do not know how long it is, or how far the first step is from zero, numbers of position, as Sir Francis Galton long ago showed,[7] may be subjected to statistical analysis. They may be arrayed, and their medians and quartiles may be found.

Gradings or ratings, as, for example, of examination papers, are in form numbers of position. They are true or just ratings only if the "step" from rank to rank as expressed in the succession of numbers, if of unknown length, is nevertheless unvarying.

If the step from position to position may legitimately be assumed to be unvarying, although no proof that it is can be offered, numbers of position may be used to express degrees of more or less. A familiar example of empirical gradings by such degrees is the scale of consanguinity. The children of brothers or sisters we call first cousins, and describe them

[6] *Vide* Thorndike, *Mental and Social Measurements*, Revised edition, ch. viii.

[7] *Natural Inheritance*, p. 47, and *vide* Bowley, *Elements of Statistics*, pp. 5, 125, and especially p. 126.

as one degree less nearly related than brothers or sisters. Children of first cousins we call second cousins, and describe them as two degrees less nearly related than brothers or sisters, and so on.

There are important phenomena of relative position in which the steps may be taken as equal, although we have no means of knowing whether they are equal in fact.

The phenomena here referred to are those in which personal feeling, private conduct, or public policy is influenced by known inequalities of merit, or of relationship, or of resemblance. The influence cannot arise, or, if it has existed, it must disappear, when inequalities are undetected. If, for example, it is impossible for any expert to prove, or for the general public to "feel sure" that the step from "native born of native parents" to "native born of foreign parents" is either longer or shorter than the step from "native born of foreign parents" to "foreign born English speaking," the actual difference of magnitude, if any, is without essential significance for studies of prejudice, consciousness of kind, or sense of social solidarity.

Accordingly, in studies of mental or social reaction to difference of attribute, or to inequalities of position, those inequalities among

the steps of relative position that are unrecognized by the individuals or by the communities immediately concerned may be ignored in statistical analysis.

When the items of a count are distributed in known frequencies of sort, and it is desired to redistribute them into grades or ranks, the grading may be refined, in accordance with the conception of classification by typical attribute.

For example, make eight numbered positions (half quartiles) and combine the frequencies into eight numbered lots, keeping together sorts that are most alike in respect of the attribute that is supposed to be manifested in differing degrees—as brunettes, let us say, might be by thirty or more nationalities, or as "orthodoxy" might be by twenty or more religious denominations—and provisionally grade the lots from one to eight.[8]

[8] If there is reason to suppose that in a true grading a plurality of all the items of the count would belong somewhere in the middle ranks, break up each lot of items into fractional parts, and assign these to the eight positions in such proportions as to make a symmetrical distribution about a mode at positions four and five. For example, assign one-half of lot three and one half of lot four to position four, one half of lot five and one half of lot six to position five, one half of lot one and one half of lot two to position three, and one half of lot seven and one half of lot eight to position six; one quarter of lot one and one quarter of lot two to position two, and one quarter of lot five and one quarter of lot six to position four, one quarter of lot three and one quarter of lot four to position five, and one quarter of lot seven and one quarter of lot eight to position seven; and

This procedure may be varied in detail to any desired extent, by making the positions and the lots fewer or more than eight, and taking coarser or finer fractional parts for distribution, so long as the final distribution is made symmetrical, or, if made unsymmetrical to correspond to known facts, is skewed in a methodical way.[9]

The inequality of two numbers a and b is measured by the difference a − b. The total inequality of n numbers, one to another, is the sum of the differences found when each number is subtracted from every other number, and each difference is counted once, or:

Total inequality of n numbers = (a − b) + (a − c) + (a − d) + ... + (a − n) + (b − c) + (b − d) + ... + (b − n) + (c − d) + ... + (c − n) + ... + (d − n).

If the smallest of n numbers be subtracted from the largest, the difference, m − s is the

one eighth of lot one to position one, and one eighth to position four, one eighth of lot two to position four, and one eighth to position five, one eighth of lot three to position two and one eighth to position three, one eighth of lot four to position three and one eighth to position six, one eighth of lot five to position three and one eighth to position six, one eighth of lot six to position six, and one eighth to position seven, one eighth of lot seven to position four and one eighth to position five, and one eighth of lot eight to position five and one eighth to position eight.

[9] This method was used by Giddings in "A Provisional Distribution of the Population of the United States into Psychological Classes," *The Psychological Review*, Vol. VIII, No. 4, July 1901, and *vide* Thorndike, *Mental and Social Measurements*, ch. viii.

range of inequality. It is the quantity of reference from which a measure of tendency to inequality among given numbers—or frequencies—may be derived.

If each lesser frequency in turn be subtracted from a maximum frequency the differences will all be positive. Their sum is the positive inequality of the frequencies in relation to the largest frequency among them, and this, divided by the number of frequencies, is the mean positive inequality.

If each greater frequency in turn be subtracted from a minimum frequency the differences will all be negative. Their sum is the negative inequality of the frequencies in relation to the smallest frequency among them, and this, divided by the number of frequencies, is the mean negative inequality.

If the ascending or descending steps of arrayed frequencies are equal, the positive and negative inequalities, as above defined, are equal. The mean inequality then is equal to one half of the difference between the maximum and the minimum frequency, or to one half of the range of inequality.

If the steps of arrayed frequencies are unequal, the positive inequality will be greater or less than the negative inequality, but the mean of the arithmetical values of the positive

and negative averages will equal as before one half of the range of inequality.

The mean inequality of frequencies, of which the positive and the negative inequalities are equal, may be called *iota*, ι. The mean positive inequality of frequencies may then be expressed as ι_1, and the mean negative inequality may be expressed as ι_2.

If the negative inequality of frequencies is equal to their positive inequality, the strength of tendency to equality among them may be described as equal to the strength of tendency among them toward inequality.

If the negative and the positive inequalities of frequencies are unequal, $\iota - \iota_1$ equals $\iota - \iota_2$, but the signs of these differences are opposite. If $\iota - \iota_1$ is positive, it measures strength of tendency toward equality; if negative, it measures strength of tendency toward inequality. If $\iota - \iota_2$ is negative, it measures strength of tendency toward equality; if positive, it measures strength of tendency toward inequality.

If the negative and the positive inequalities of frequencies are equal $\frac{\iota}{\Sigma f}$ is a coefficient of inequality; if they are approximately equal it is an approximate coefficient of inequality.

In any case, $\frac{\iota - \iota_1}{\Sigma f}$ or $\frac{\iota - \iota_2}{\Sigma f}$ is a precise coefficient of strength of tendency toward equality or toward inequality, according to sign.

These relations stand out sharply in graphic presentation.

If the positive and the negative inequalities of frequencies are equal, the frequencies, when plotted as equi-distant ordinates arrayed, will make a figure that may be bounded at the top by a straight slant line.

If the positive inequality of frequencies exceeds the negative inequality, the frequencies, when plotted as equi-distant ordinates arrayed, will make a figure that may be bounded at the top by a downward curving or concave line.

If the negative inequality of frequencies exceeds the positive inequality the frequencies when plotted as equi-distant ordinates arrayed, will make a figure that may be bounded by an upward curving or convex line.

Central tendency or the concentration of measures about a mean, or, conversely, their dispersion or scatter, is measured by the average deviation or the standard deviation (σ) of the measures from the mean, or by a coefficient of variation derived from σ.

Contingency, as the term is used in statistics, is the numerically measured degree, or intensity, of association of one phenomenon with another, for example of blue eyes with fair hair, or the numerically measured degree of dependence of one phenomenon upon another. The measure is a percentage or a coefficient.[10]

Concurrence is the appearance between corresponding limits of position in their respective arrays, of two correlative measures, a and b, which appertain to an identical thing or person.

Measures constituting an array A, and measures constituting another array B, may appertain to identical and identified things, or persons, or groups, each of which (or whom) has contributed two measures; for example, the *Leviathan*, beam and draught; Jack Dempsey, height and weight; Kansas, population and wealth. Two items, one in array A, the other in array B, which appertain to the same measured identity, are correlative, or paired, items. Correlative items may or may not appear in corresponding halves of their respective arrays: that is, for example, both items or only one of them may be found in a super-median,

[10] For methods *vide* Karl Pearson, *Grammar of Science*, third edition, ch. v; and Yule, *An Introduction to the Theory of Statistics*, ch. v.

or in a sub-median, or in an inter-quartile position. The appearance of correlative items in corresponding halves of two arrays is Concurrence.

The ratio of the number of concurrences to the number of measures in one half of each array (or of either array), or to one quarter of the whole number of measures in each array, is the measure of concurrence.

If the positions of correlative items in their respective arrays are determined by chance, concurrence and non-concurrence are equally probable. If concurrence exceeds or is less than non-concurrence, specific causation is indicated, and the measure of concurrence is the measure of this probability.

Correlation, positive or negative, is the numerically measured variation of an array of numerical items with another array.

There are various measures of correlation. The one most often used and most relied on is the Pearsonian coefficient. A succinct but clear and adequate analysis of it is:

The formula used is, $r=\frac{\Sigma x \cdot y}{\sqrt{\Sigma x^2}\sqrt{\Sigma y^2}}$ in which the x's are the deviations of the measures in the first series from their average, and the y's are the deviations of the measures in the second series from their average. The letter r stands for the coefficient of correlation. The formula reads as follows: The coefficient of correlation is the quotient of the algebraic sum

of the products of each x deviation and its corresponding y deviation, divided by the product of the square root of the sum of the squares of the x deviations multiplied by the square root of the sum of the squares of the y deviations.[11]

Coefficients derived from positions and rankings are extensively used in measuring correlations of school records and other mental and proficiency data.[12]

Coördination is equivalence of position. For example, in botanical or in zoölogical classification genera are coördinate one with another, but are subordinate to orders as orders are to classes; species are coördinate one with another, but are subordinate to genera. In the ecclesiastical hierarchy priests are of coördinate rank, bishops of coördinate higher rank, and archbishops of coördinate rank yet higher.

Superordinated or subordinated coördination, or the coördination of units within each rank throughout a succession of ranks, one above or one below another, is obviously a phenomenon incidental to all subclassification, creating intra-secting categories, or category within category, in descending comprehensiveness.

And when categories are intra-secting, the whole content of category B falls within cate-

[11] Marion Rex Trabue, *Measuring Results in Education*, p. 395.

[12] Multiple correlation and partial correlation are subjects too technical for the purposes of this chapter.

gory A; the whole content of category C falls within category B; and so on.

Therefore, statistically, coördination, superordinate or subordinate, is the appearance of certain same units in each of n categories.

Identity or sameness of content in each of two or more categories may be called Categorical Solidarity.

Since all units of category B, intra-secting category A, occur also in A, it is plain that in these two categories taken together there are as many unit instances of "same content" in more than one category as there are units in category B.

All units of category C, intra-secting B, occur also in B and in A. Therefore, taking the first three categories together, they present as many unit instances of "same content" in more than one category as there are units in B plus the number of units in C.

All units of category D occur also in C, in B, and in A. Therefore, in these four categories taken together there are as many unit instances of "same content" in more than one category as there are units in B, plus units in C, plus units in D.

In general, if categorical solidarity be expressed by S, a comprehensive category by K,

and intra-secting categories by k_1, k_2, k_3, . . . , k_n

$$S = k_1 + k_2 + k_3 + \ldots + k_n$$

S, so obtained, is an amount, and it is affected by the number of categories used. The degree, or average density, of solidarity, category with category, may be obtained, therefore by dividing S by n.

If the number of units in each of n categories were the same, and if the "same content" (neither more nor less, nor different) were in each and all categories, K would equal k_1, would equal k_2, would equal k_3, and so on. Indicating the greatest arithmetically possible solidarity of n categories by G, we of course have $G = K(n-1)$, and the greatest possible degree of solidarity of n categories is $\frac{G}{n}$.

The ratio $\frac{S}{n} : \frac{G}{n}$ or $\frac{S}{G}$ is the coefficient of solidarity for any values of K, k_1 and n.

All measures of solidarity are corresponding measures of coördination.

Any association of units presents to the observer certain aspects which admit of quantitative description by statistical methods.

These aspects are: 1, Extent; 2, Duration;

3, Strength; 4, Compositeness; 5, Form; 6, Reaction; 7, Central Point or "center of gravity" of Reaction; 8, Contingency, Concurrence, and Correlation.

The statistical examination of the extent and the duration of association is the simplest of statistical operations. It involves only completeness and accuracy of count, and accurate determinations of date.

Strength of association is resistance to dissolution or disintegration. Dissolution, or disintegration, is statistically measured by the percentage, or other proportion, of associations of a given kind that break up within a given time. Family cohesion, for example, is measured by the divorce rate.

When units of more than one sort are combined in a mixture, the compositeness thereby arising is of three degrees, which may be named respectively, Variegation, Approximate Composition, and True Composition or Heterogeneity.

Variegation is determined by two variable quantities only, namely, (1) the number of sorts in the composition, and (2) the number of items in each sort, that is, the frequencies of the sorts. Differences of magnitude among variants (i. e., units of sort) and the amount

of difference that exists between any one sort and any other sort (i.e., inequalities of interval or step) are neglected.

When the categorical or sort frequencies of a composition are approximately equal, the variegation may be described as uniform.

When sort frequencies are unequal, and one frequency exceeds any other, the variegation thence resulting may be described as typical.

Variegation is measured, and thereby quantitatively described, by the coefficient of tendency toward equality, or toward inequality, as the case may be, of the sort frequencies, of the composition.

Approximate composition takes account of the difference between each frequency and every other frequency in the composition. It is measured by the total inequality of the frequencies.

True composition, or heterogeneity, is the totality of differences in a composition. It includes not only frequencies of sort, and inequalities of frequencies one to another, but also all differences of item from item (in respect of dimension, weight, value, or other magnitude), and all differences of interval or step. If the data are known, heterogeneity can be computed by simple algebraic methods, which are, however, tedious.

Variegation, fortunately the simplest phase of compositeness, is a fact of significance for the organic and social sciences. Easily measured, it is a measure itself, of strength of tendency, or of influences selective or constraining.

Average deviation and standard deviation are assumed to measure the strength of a mode-making tendency, selection, or pressure acting upon variates, i. e., units of size.

If, for example, poppy capsules be gathered at random from a field, and the number of stigmatic bands on each capsule be counted, and the deviation from the mean number be found to be very small, the fact is supposed to tell us that the poppies in that field, or their progenitors, have survived a severe natural selection. The smaller the standard deviation, it is inferred, the greater has been the selective or mode-making pressure.[12]

The same significance attaches to variegation. The coefficient of tendency to or from equality is a measure of type-making tendency, selection, or pressure for frequencies of sort, probably quite as trustworthy as the coefficient of variability for frequencies of size.

If seeds of a dozen kinds be planted simultaneously and indiscriminately, but in equal numbers, in a patch of garden, which is then

[12] *Vide* Karl Pearson, *Grammar of Science*, second edition, ch. x, sec. 5.

neglected, and six weeks later plants of the dozen kinds are flourishing in approximately equal numbers, kind for kind, we infer that no selective influence has affected them; while if plants of one or two kinds at the end of the six weeks are relatively numerous, of other kinds relatively few, and of the remaining kinds very few, we infer that selection has been rigourous.

Uniformity of variegation then, means a negligible type-making tendency, selection, or pressure; while marked typicality of sort frequencies means a type-making tendency relatively strong, or a type-making selection or pressure relatively severe.

The Forms of association are (1) Tangential, or exclusive, no unit of one association occurring in another association; (2) Inter-secting, certain units occurring in more than one association but no association being wholly comprised in another; and (3) Intra-secting, all the units of association B occurring in association A, all the units of association C occurring in association B, and so on in descending comprehensiveness.

Tangential association is otherwise described as "segregation" when the units of each association are similar. The simple statistical problem presented is to count the number of

like units that in one or another way are placed or combined in exclusive grouping.

Intra-secting associations are a case of subclassification and coördination, superordinate or subordinate. The coefficient of coördination is a measure of intra-secting association.

The Reactions of Association are measured in units of time, of displacement, and of transformation. Promptness and persistence of reaction are measured in units of time. Degree, extent and amount of reaction are measured in units of displacement or transformation. The statistical description of these reactions involves no unusual developments of method. The difficulties that are encountered arise in the determination of data, in making the original measurements.

The Central Point of Reaction, or, using a figure of speech, the center of gravity of reaction, is that point about which all reactions, including opposing ones, are in equilibrium. If units react in different ways and with equal power or "weight" the center of reaction is the median of the array of the units. If the several units, either individually or when massed in those squadrons of units which we call frequencies, react with different power or "weight," the center of reaction is found on that side of the median where the heavier

weighting occurs. The statistical problems, accordingly, that arise in any attempt to determine the center of gravity of associational reaction are those which in statistical analysis are known as questions of weighting.

No phenomena of society are of greater interest than are the shiftings of the centers of associational reaction. Among these are the shifting of the center of gravity in politics between opposing parties, between radicals and conservatives, between classes and masses, between rationalists and the upholders of instituted authority.

The foregoing aspects of association are of interest in themselves and also, in a higher degree, because of their relation to Contingency, Concurrence, or Correlation. In determining how far association or any phase of it is quantitatively linked with any other fact, we get close to the problems of law and cause.

The contingency of any phenomenon of association may be with an extraneous fact, or with any other phenomenon of association itself. Extraneous facts collectively are the environment. The facts of association whose contingencies one with another can be determined are the aspects of association which have here been enumerated.

Among the contingencies of associational phenomena one upon another which admit of statistical determination the following are especially significant.

The strength of association may vary with extent or with duration. It may be found that cohesion increases to a certain determinable point more rapidly than extent increases, and beyond that point less rapidly. For example, as a fact of observation, large states, large towns, large families may be more coherent than small ones. A similar relation may be found between cohesion and duration.

Again, within limits, the stability of a group may be unaffected by a mobility of its units which permits individual units to disappear from the group and other units from without to replace them. Beyond a determinable limit such mobility of units may impair group stability.

The contingencies of associational phenomena with the degrees and typicalities of composition are numerous and highly important.

Within determinable limits similar reactions of associated units are contingent upon other similarities of the units. Like units, in other words, tend to react in like ways. When sorts are combined in a mixture, the units of a sort may react in ways different from the ways in which they react when not in composition.

And the effects of composition upon reaction may be a consequence in part of the proportions in which sorts are combined.

Inertia or momentum of associational reaction increases in a determinable ratio with the typicality of variegation, that is, as one sort tends to dominate a composition. This is a familiar fact of our social life in all its phases, from fashion to politics. Transformation goes on at an increasing rate, which may be determined, as the proportion of variants from type increases.

And at this point contingency of associational reaction upon external fact is discovered.

Adapation to environment or circumstance increases typicality. Crisis multiplies variants.

Relations of toleration, the reactions of conflict and the reactions of adjustment are notoriously contingent upon forms of association, and these contingencies in a great number of instances admit of quantitative determination. The contingency of toleration is highest when association is tangential. Conflict is most acute when associations are intersecting. Adjustments, both of the interests of units one with another and between the opposing tendencies towards typicality and towards variability, are contingent upon the development of intra-secting association.

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